



Panchakshari Shivacharya Trust's Aloor

# **CHANNABASWESHWAR PHARMACY COLLEGE (DEGREE), LATUR**

Basweshwar Chowk, Kava Road, Latur-413512 (Maharashtra)



## **CRITERION 3**

### **RESEARCH INNOVATION AND EXTENSION**

#### **3.3**

#### **Research Publication and Awards**

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##### **3.3.1**

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

- a) Link to the uploaded papers the first page/full paper (with author and affiliation details) on the institutional website**





Panchakshri Shivacharya Trust's

## CHANNABASWESHWAR PHARMACY COLLEGE (DEGREE)

Kava Road, Basweshwar Chowk, Latur-413512 (Maharashtra) Tel./Fax :- (02382) 243855

DTE Code :- 2253, University Code :- 947, MSBTE Code :- 2041

Email:- channabasweshwar@gmail.com / principalcbpc@gmail.com Website:- www.channabasweshwar.org

Approved by:- Govt. of Maharashtra, PCI, New Delhi, Affiliated to:- S.R.T.M. University, Nanded, MSBTE, Mumbai.

### 3.3 Research Publication and Awards

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

a) Link to the uploaded papers the first page/full paper (with author and affiliation details) on the institutional website

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Sr. No.	Calendar year	Number of Research Publication	Page No.
1	2022	23	1-42
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**Principal**  
Channabasweshwar Pharmacy  
College (Degree), Latur

Sr. No	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Calendar Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number		
							Link to Website of the Journal	Link to article/paper/abstract of the article	Is it listed in UGC Care list
1	$\alpha$ -Amylase Inhibitory Property of major phytoconstituents of polyherbal formulation: An In-Vitro and Molecular Interaction Study	Dr. O. G. Bhusnure	Department of Quality Assurance	Bulletin of Environment, Pharmacology and Life Sciences	2022	2277-1808	<a href="http://www.bepils.com">http://www.bepils.com</a>	<a href="https://bepils.com/bepilsjan2022/3.pdf">https://bepils.com/bepilsjan2022/3.pdf</a>	Clarivate Analytics, web of science ,Chemical Abstract Services
2	Design, Development and Evaluation of Honey Loaded Microsponges	Dr. S. M. Vijayendra Swamy	Department of Pharmaceutics	Bulletin of Environment, Pharmacology and Life Sciences	2022	2277-1808	<a href="http://www.bepils.com">http://www.bepils.com</a>	<a href="https://bepils.com/bepilsmarc h2022/3.pdf">https://bepils.com/bepilsmarc h2022/3.pdf</a>	Clarivate Analytics, web of science ,Chemical Abstract Services
3	Design, Development and Evaluation of Liposomes Containing Anticancer Drug	Dr. S. N. Nagoba	Department of Pharmaceutics	NeuroQuantology	2022	1303-5150	<a href="https://neuroquantology.com/about.php">https://neuroquantology.com/about.php</a>	<a href="https://neuroquantology.com/Archives7/volume-7Volume8/2020/Issue-10/3205">https://neuroquantology.com/Archives7/volume-7Volume8/2020/Issue-10/3205</a>	Scopus, Embase
4	Studies On The Mucilage Extracted From Okra (Abelmoschus Esculentus) Fruit Polysaccharides By Novel Extraction Method	Dr. S. N. Nagoba	Department of Pharmaceutics	Journal of Pharmaceutical Negative Results	2022	2229-7723	<a href="https://www.pnrjournal.com/index.php/home">https://www.pnrjournal.com/index.php/home</a>	<a href="file:///C:/Users/compu/Downloads/JPNR---S09+-+1263.pdf">file:///C:/Users/compu/Downloads/JPNR---S09+-+1263.pdf</a>	Index Copernicus, Scimago Journal Ranking
5	Formulation and Evaluation of nanoparticulate topical gel containing Celecoxib	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Health Sciences	2022	2550-6978	<a href="http://ijhsnet.com/">http://ijhsnet.com/</a>	<a href="https://sciencescholar.us/journal/index.php/ijhs/article/view/11793">https://sciencescholar.us/journal/index.php/ijhs/article/view/11793</a>	Ebesco, Scientific Index, Google Scholar
6	Development and Validation of Spectrophotometric Methods for Simultaneous Estimation of Cefixime Trihydrate and Linezolid in Tablet Dosage Form	Ms. R. B. Wale	Department of Pharmaceutical chemistry	Journal of University of Shanghai for Science and Technology	2022	1007-6735	<a href="https://jusst.org/">https://jusst.org/</a>	<a href="https://jusst.org/wp-content/uploads/2022/02/Development-and-Validation-of-Spectrophotometric-Methods-for-Simultaneous-Estimation-of-Cefixime-Trihydrate-and-Linezolid-in-Tablet-Dosage-Form.pdf">https://jusst.org/wp-content/uploads/2022/02/Development-and-Validation-of-Spectrophotometric-Methods-for-Simultaneous-Estimation-of-Cefixime-Trihydrate-and-Linezolid-in-Tablet-Dosage-Form.pdf</a>	Scopus, Embase
7	Dielectric Constant, Density, and Refractive Index in Binary Mixtures of Ethanol with N,N-Dimethyl formamide	Dr. R. S. Sakhare	Department of Quality Assurance	Russian Journal of Physical Chemistry A	2022	0036-0244	<a href="https://www.springer.com/journal/11504">https://www.springer.com/journal/11504</a>	<a href="https://link.springer.com/article/10.1134/S0036024422050235">https://link.springer.com/article/10.1134/S0036024422050235</a>	Springer, Google Scholar, Proquest
8	Evaluation of the hypolipidemic activity of Polyherbal formulation through In-vivo and Insilico studies	Dr. S. S. Ladde	Department of Pharmacology	International Journal of Health Sciences	2022	2550-696X	<a href="https://ijhsnet.com/">https://ijhsnet.com/</a>	<a href="https://sciencescholar.us/journal/index.php/ijhs/article/view/8309">https://sciencescholar.us/journal/index.php/ijhs/article/view/8309</a>	Ebesco, Scientific Index, Google Scholar
9	Formulation and evaluation of carbon nanotubes for topical drug delivery	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Health Sciences	2022	2550-6978	<a href="https://sciencescholar.us/journal/index.php/ijhs">https://sciencescholar.us/journal/index.php/ijhs</a>	<a href="https://sciencescholar.us/journal/index.php/ijhs/article/view/9979">https://sciencescholar.us/journal/index.php/ijhs/article/view/9979</a>	Ebesco, Scientific Index, Google Scholar
10	Formulation and Evaluation of Fast Dissolving oral film of Promethazine Theoclate	Ms. V. M. Gaikwad	Department of Pharmaceutics	Asian Journal of organic and Medicinal Chemistry	2022	2456-8937	<a href="https://ajomc.asianpubs.org">https://ajomc.asianpubs.org</a>	<a href="https://ajomc.asianpubs.org/Uploads/Files/AJOMC%20Vol.%207%20No.%202%20Apr%20-%20June%202022%20Issue%20-%2020V%202022.pdf">https://ajomc.asianpubs.org/Uploads/Files/AJOMC%20Vol.%207%20No.%202%20Apr%20-%20June%202022%20Issue%20-%2020V%202022.pdf</a>	Crossref, PKP INDEX, Dimensions
11	Formulation and Evaluation of Liposomes Containing Erlotinib Hydrochloride	Dr. S. N. Nagoba	Department of Pharmaceutics	Bulletin of Environment, Pharmacology and Life Sciences	2022	2277-1808	<a href="http://www.bepils.com">http://www.bepils.com</a>	<a href="https://bepils.com/bepilsmarc h2022/1.pdf">https://bepils.com/bepilsmarc h2022/1.pdf</a>	Clarivate Analytics, web of science ,Chemical Abstract Services
12	In silico analysis of green tea catechins for design of adenosine A2A antagonist and nav 1.7 inhibitors	Dr. Bhusnure O. G.	Department of Quality Assurance	Journal of Medical Pharmaceutical and Allied Sciences	2022	2320-7418	<a href="https://www.jmpas.com/">https://www.jmpas.com/</a>	<a href="https://jmpas.com/admin/assets/article_issue/16723_35065JMPAS_NOVEMBER,_DECEMBER_2022.pdf">https://jmpas.com/admin/assets/article_issue/16723_35065JMPAS_NOVEMBER,_DECEMBER_2022.pdf</a>	Chemical Abstract Services, Google Scholar, Scopus



13	In-silico exploration of piperine for invent proton pump and protein phosphatase non-receptor Inhibitors in gastric and peptic ulcer	Dr. Bhushure O. G.	Department of Quality Assurance	Journal of Medical Pharmaceutical and Allied Sciences	2022	2320-7418	<a href="https://www.jmpas.com/">https://www.jmpas.com/</a>	<a href="https://jmpas.com/admin/sets/article_issue/1671470446JMPAS_NOVEMBER,_DECEMBER_2022.pdf">https://jmpas.com/admin/sets/article_issue/1671470446JMPAS_NOVEMBER,_DECEMBER_2022.pdf</a>	Chemical Abstract Services, Google Scholar, Scopus
14	Formulation and Evaluation of Natural Polysaccharide containing Diclofenac sodium	Dr. S. N. Nagoba	Department of Pharmaceutics	NeuroQuantology	2022	1303-5150	<a href="https://neuroquantology.com/about.php">https://neuroquantology.com/about.php</a>	<a href="https://neuroquantology.com/archives?volume=Volume62020&amp;issue=No%205">https://neuroquantology.com/archives?volume=Volume62020&amp;issue=No%205</a>	Scopus, Embase
15	Formulation and Evaluation of Niosomal Topical Gel Containing Monoammonium Glycyrrhizinate	Dr. S. N. Nagoba	Department of Pharmaceutics	Bulletin of Environment, Pharmacology and Life Sciences	2022	2277-1808	<a href="http://www.bepils.com">http://www.bepils.com</a>	<a href="https://bepils.com/bepilsmarc-h2022/2f.pdf">https://bepils.com/bepilsmarc-h2022/2f.pdf</a>	Clarivate Analytics, web of science, Chemical Abstract Services
16	In-Vitro Estimation of Antioxidant and Antidiabetic Potential of Plant Extract	Dr. S. M. Vijayendra Swamy	Department of Pharmaceutics	Neuroquantology	2022	1303-5150	<a href="https://www.neuroquantology.com/">https://www.neuroquantology.com/</a>	<a href="https://www.neuroquantology.com/open-access/IN-VITROESTIMATION-OF-ANTIOXIDANT-AND-ANTIDIABETIC-POTENTIAL-OF-PLANT-EXTRACTS_2038/">https://www.neuroquantology.com/open-access/IN-VITROESTIMATION-OF-ANTIOXIDANT-AND-ANTIDIABETIC-POTENTIAL-OF-PLANT-EXTRACTS_2038/</a>	Scopus, Embase
17	Validation of Reversed - Phase HPLC method for the Estimation of Cefixime Trihydrate and Linezolid in Tablet dosage form	Ms. R. B. Wale	Department of Pharmaceutical chemistry	International journal of analytical and experimental modal analysis	2022	0886-9367	<a href="https://iiaema.com/">https://iiaema.com/</a>	<a href="https://drive.google.com/file/d/1eifPrms-nkwpU3Kd9AfwakMTwvMNXI/view">https://drive.google.com/file/d/1eifPrms-nkwpU3Kd9AfwakMTwvMNXI/view</a>	Scopus, Google Scholar, Thomson Reuters
18	Design Development and Evaluation of Medicated Lozenges containing Lamotrigine	Dr. S. N. Nagoba	Department of Pharmaceutics	European Chemical Bulletin	2022	2063-5346	<a href="https://www.surchambull.com/">https://www.surchambull.com/</a>	<a href="https://www.surchambull.com/uploads/paper/c869f191b90385290015c87601b0fb6b.pdf">https://www.surchambull.com/uploads/paper/c869f191b90385290015c87601b0fb6b.pdf</a>	Elsevier, Crossref, Orcid
19	Nanocrystallization by Anti-Solvent Precipitation Technique for Solubility and Dissolution Enhancement of Telmisartan	Ms.V. K. Khadkutkar	Department of Pharmaceutics	Journal of University of Shanghai for Science and Technology	2022	1007-6735	<a href="https://juust.org/">https://juust.org/</a>	<a href="https://juust.org/wp-content/uploads/2022/04/Nanocrystallization-by-Anti-Solvent-Precipitation-Technique-for-Solubility.pdf">https://juust.org/wp-content/uploads/2022/04/Nanocrystallization-by-Anti-Solvent-Precipitation-Technique-for-Solubility.pdf</a>	Scopus, Embase
20	Osteoarthritis : Management	Dr. S. M. Vijayendra Swamy	Department of Pharmaceutics	International Journal of Advance and Innovative Research	2022	2394-7780	<a href="https://iairjournal.in/">https://iairjournal.in/</a>	<a href="https://iairjournal.in/about-journal/iair-volume-9-issue-3-i-july-september-2022.php">https://iairjournal.in/about-journal/iair-volume-9-issue-3-i-july-september-2022.php</a>	Google Scholar, Thomson Reuters, End Note, Research bib
21	Formulation and Evaluation of Oral Gel from Oscimum Sanctum Extract for Treatment of OSMF	Dr. O.G. Bhushure	Department of Quality Assurance	International Journal of Pharmaceutical Research and Applications	2022	2456-4494	<a href="https://www.ijprajournal.com/?gclid=EAIaIqobChMkdrfjKXQgwMV5ccCB33DA4EEAAyASAAEGLePD_BwE">https://www.ijprajournal.com/?gclid=EAIaIqobChMkdrfjKXQgwMV5ccCB33DA4EEAAyASAAEGLePD_BwE</a>	<a href="https://www.ijprajournal.com/post-issue-volume.php?issueid=39&amp;title=Volume%207%20,%20Issue%204%20July-Aug%202022">https://www.ijprajournal.com/post-issue-volume.php?issueid=39&amp;title=Volume%207%20,%20Issue%204%20July-Aug%202022</a>	Google Scholar, CiteSeerx,
22	Formulation and Evaluation of Nanosponge Based Topical Gel Preparation by QbD Approach	Dr. O.G. Bhushure	Department of Quality Assurance	International Journal of Scientific Research in Science and Technology	2022	2395-602X	<a href="https://ijsrst.com/archives.php">https://ijsrst.com/archives.php</a>	<a href="https://ijsrst.com/paper/10311.pdf">https://ijsrst.com/paper/10311.pdf</a>	Google Scholar, Thomson Reuters, End Note, NCBI, Publons
23	Anticonvulsant Potential of the Oxazetidine Derivat	Dr. P. S. Giram	Department of Pharmacology	Journal of University of Shanghai for Science and Technology	2022	1007-6735	<a href="https://juust.org/">https://juust.org/</a>	<a href="https://juust.org/volume24-issue-8/">https://juust.org/volume24-issue-8/</a>	Scopus, Embase
24	Design and Optimization of Herbal Gel containing Andrographis Paniculata Nees	Dr. S. M. Vijayendra Swamy	Department of Pharmaceutics	International Journal of Advance and Innovative Research	2021	2394-7780	<a href="https://iairjournal.in/">https://iairjournal.in/</a>	<a href="https://iairjournal.in/about-journal/iair-volume-8-issue-4-v-october-december-2021.php">https://iairjournal.in/about-journal/iair-volume-8-issue-4-v-october-december-2021.php</a>	Google Scholar, Thomson Reuters, End Note
25	Design, Synthesis and Biological Investigation of Some Novel Quinazolin-4(3H)-One Tethered 1,3,4-Thiadiazole-Thiol Motifs as Direct Enoyl acyl Carrier Protein Reductase Inhibitors	Dr. A. N. Deshpande	Department of Pharmaceutical chemistry	Journal of Pharmaceutical Research International	2021	2456-9119	<a href="https://journalipri.com/">https://journalipri.com/</a>	<a href="https://journalipri.com/index.php/IPRI/article/view/3863">https://journalipri.com/index.php/IPRI/article/view/3863</a>	Ebsco, Google Scholar, Publon, Proquest
26	Formulation and Evaluation of 3D Printed pregabalin Tablets Targeted for neuropathic pain By QBD Approach For Personalized Medicine	Dr. O.G. Bhushure	Department of Quality Assurance	International Journal of Life science and Pharma Research	2021	2250-0480	<a href="https://www.ijpr.com/index.php/journal">https://www.ijpr.com/index.php/journal</a>	<a href="file:///C:/Users/comau/Downloads/Formulation_and_Evaluation_of_3D_Printed_Pregabalin%20(1).pdf">file:///C:/Users/comau/Downloads/Formulation_and_Evaluation_of_3D_Printed_Pregabalin%20(1).pdf</a>	Google Scholar, Crossref, doi



27	Development and Characterization of Terminalia arjuna Phospholipid Complex and Its Tablet Formulation by Qbd Approach	Dr. O.G. Bhusnure	Department of Quality Assurance	International Journal of Life science and Pharma Research	2021	2250-0480	<a href="https://journals.indexscopus.com/journal/40294">https://journals.indexscopus.com/journal/40294</a>	<a href="https://ijlpr.com/index.php/journal/article/view/1131_m/link">https://ijlpr.com/index.php/journal/article/view/1131_m/link</a>	Google Scholar, Crossref, doi
28	Pharmacognostic Investigation of Leaves and Bark of Cochlospermum Religiosum Linn	Dr. O.G. Bhusnure	Department of Quality Assurance	Journal of University of Shanghai for Science and Technology	2021	1007-6735	<a href="https://just.org/">https://just.org/</a>	<a href="file:///C:/Users/compu/Downloads/Pharmacognostic%20Investigation%20of%20Leaves%20and%20Bark%20of%20Cochlospermum%20Religiosum%20Linn.pdf">file:///C:/Users/compu/Downloads/Pharmacognostic Investigation of Leaves and Bark of Cochlospermum Religiosum Linn.pdf</a>	Scopus, Embase
29	Evaluation of Antioxidant Power of Polyherbal Formulation	Dr. S. S. Ladde	Department of Pharmacology	Journal of Complementary Medicine Research	2021	2577-5669	<a href="https://www.ijocmr.com/index.php?mno=121659">https://www.ijocmr.com/index.php?mno=121659</a>	<a href="https://www.ijocmr.com/journal/article/view/1131_m/link">Journal of Complementary Medicine Research (jocmr.com)</a>	Chemical Abstract Services, Google Scholar, Scopus
30	Formulation and Evaluation of Dexamethorphan Chocolate for Pediatrics	Mr. S. B. Gholve	Department of Quality Assurance	Journal of Pharmaceutical Research International	2021	2456-9119	<a href="http://www.ijpronline.com">http://www.ijpronline.com</a>	<a href="http://www.ijpronline.com/ViewArticleDetail.aspx?ID=21321">http://www.ijpronline.com/ViewArticleDetail.aspx?ID=21321</a>	Chemical Abstract Services, Ebsco, Publons, Google Scholar
31	Formulation and Evaluation of Topical Microemulgel Containing Terbinafine Hydrochloride	Dr. S. N. Nagoba	Department of Pharmaceutics	Journal of Pharmaceutical Research International	2021	2456-9119	<a href="https://journalijpri.com/">https://journalijpri.com/</a>	<a href="https://journalijpri.com/index.php/IJRI/article/view/3876">https://journalijpri.com/index.php/IJRI/article/view/3876</a>	Chemical Abstract Services, Ebsco, Publons, Google Scholar
32	Formulation And Evaluation Of Transdermal Patch containing Antihistaminic Drug Bilastine	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Biology, Pharmacy and Allied Sciences	2021	2277-4998	<a href="https://www.ijbpas.com/">https://www.ijbpas.com/</a>	<a href="https://ijbpas.com/pdf/2021/December/MS_IJBPAS_2021_DEC_SPCL_2025.pdf">https://ijbpas.com/pdf/2021/December/MS_IJBPAS_2021_DEC_SPCL_2025.pdf</a>	Google Scholar, Chemical Abstract Services, ISI, Thomson Reuters
33	Formulation Development and evaluation of Liposomal Drug Delivery System Containing Etoposide	Dr. S. N. Nagoba	Department of Pharmaceutics	Journal of Complementary Medicine Research	2021	2146-8397	<a href="https://www.jocmr.com/">https://www.jocmr.com/</a>	<a href="https://www.ejmanager.com/mnsteps/55/55-1638461458.pdf?m=1679038665">https://www.ejmanager.com/mnsteps/55/55-1638461458.pdf?m=1679038665</a>	Chemical Abstract Services, Google Scholar, Scopus
34	Novel 5-fluorouracil-Embedded non-woven PVA - PVP electrospun nanofibers with enhanced anti-cancer efficacy: Formulation, evaluation and in vitro anti-cancer activity	Dr. O. G. Bhusnure	Department of Quality Assurance	Journal of Drug Delivery Science and Technology	2021	1773-2247	<a href="https://www.sciencedirect.com/journal/journal-of-drug-delivery-science-and-technology">https://www.sciencedirect.com/journal/journal-of-drug-delivery-science-and-technology</a>	<a href="https://www.sciencedirect.com/science/article/abs/pii/S1773224721003348">https://www.sciencedirect.com/science/article/abs/pii/S1773224721003348</a>	Scopus, Google Scholar, Thomson Reuters
35	Development of Novel Substituted Indole molecules as Potential NAV1.7 inhibitors	Dr. O. G. Bhusnure	Department of Quality Assurance	Journal of Pharmaceutical and allied Science	2021	2320-7418	<a href="https://www.ajol.info/index.php/jophas">https://www.ajol.info/index.php/jophas</a>	<a href="https://jmpas.com/admin/assets/article_issue/1642430948JMPAS_NOVEMBER-DECEMBER_2021.pdf">https://jmpas.com/admin/assets/article_issue/1642430948JMPAS_NOVEMBER-DECEMBER_2021.pdf</a>	Google Scholar, Cite factor, Crossref
36	Pharmacokinetic Profile of Polyherbal Tablets Comprising Extracts of Antidiabetic Medicinal Plants	Dr. S. N. Nagoba	Department of Pharmaceutics	Journal of Complementary Medicine Research	2021	2577-5669	<a href="https://www.jocmr.com/">https://www.jocmr.com/</a>	<a href="https://www.ejmanager.com/fulltextpdf.php?mno=121659">https://www.ejmanager.com/fulltextpdf.php?mno=121659</a>	Chemical Abstract Services, Google Scholar, Scopus
37	Phytochemical Study on Sesbania Sesban Isolated Phytoconstituents For In-Vivo Anti-Inflammatory And In-Vitro Antioxidant & Anticancer Activity	Dr. S. N. Nagoba	Department of Pharmaceutics	Journal of Complementary Medicine Research	2021	2146-8397	<a href="https://www.jiccp.com/index.php?mno=121659">https://www.jiccp.com/index.php?mno=121659</a>	<a href="https://www.bibliomed.org/mnsfulltext/55/55-1638459660.pdf?1679120260">https://www.bibliomed.org/mnsfulltext/55/55-1638459660.pdf?1679120260</a>	Chemical Abstract Services, Google Scholar, Scopus
38	Preparation and Standardization of Egg Shell Bhasma	Dr. R. S. Sakhare	Department of Quality Assurance	International Journal of Pharmaceutical Sciences and Drug Research	2021	0975-248X	<a href="https://www.ijpsdr.com">https://www.ijpsdr.com</a>	<a href="https://www.ijrt.org/master/publishedpaper/IJRT153352_PAPER.pdf">https://www.ijrt.org/master/publishedpaper/IJRT153352_PAPER.pdf</a>	Cas, Ebsco, Google Scholar, Cite factor, Crossref
39	QBD Based RP-HPLC Method Development and Validation for the Estimation of Quetiapine in Presence of Related Substances	Mr. S. B. Gholve	Department of Quality Assurance	Bulletin of Environment, Pharmacology and Life Sciences	2021	2277-1808	<a href="https://bepls.com/">https://bepls.com/</a>	<a href="https://bepls.com/beplsjuly2021/21.pdf">https://bepls.com/beplsjuly2021/21.pdf</a>	Clarivate Analytics, web of science, Chemical Abstract Services
40	RP-HPLC Method Development and Validation for the Estimation of Lansoprazole in Presence of Related Substances by Qbd Approach	Mr. S. B. Gholve	Department of Quality Assurance	Journal of Pharmaceutical Research International	2021	2456-9119	<a href="http://www.ijpronline.com">http://www.ijpronline.com</a>	<a href="https://journalijpri.com/index.php/IJRI/article/view/2760">https://journalijpri.com/index.php/IJRI/article/view/2760</a>	Chemical Abstract Services, Ebsco, Publons, Google Scholar
41	Stability indicating High Performance Liquid Chromatography Method for Simultaneous Estimation of cAcetophylline and Doxofylline in Pharmaceutical Dosage form	Dr. R. S. Sakhare	Department of Quality Assurance	International journal of Pharmaceutical sciences and research	2021	2320-5148	<a href="https://ijpsr.com/">https://ijpsr.com/</a>	<a href="https://www.ijpsr.com/VOLUME%2013%20(2022)%20INTERNATIONAL%20JOURNAL%20OF%20PHARMACEUTICAL%20SCIENCES%20AND%20RESEARCH%20(IJPSR).htm">VOLUME 13 (2022)   INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH (ijpsr.com)</a>	Embase, Google Scholar, Web of Science, Ebsco

42	Synthesis and molecular docking analysis of Oxazetidine derivatives for neurological disorders	Dr. O.G. Bhusnure	Department of Quality Assurance	Journal of medical pharmaceutical and allied sciences,	2021	2320-7418	<a href="http://www.jmpas.com">www.jmpas.com</a>	<a href="https://jmpas.com/admin/sets/article_issue/1638459735JMPAS_JULY-AUGUST_2021.pdf">https://jmpas.com/admin/sets/article_issue/1638459735JMPAS_JULY-AUGUST_2021.pdf</a>	Scopus, UGC Care, Google Scholar, Research bib, Crossref
43	Isolation, Identification, Characterization and Antimicrobial Study of Probiotic from Sauerkrut	Dr. O.G. Bhusnure	Department of Quality Assurance	Journal of Complementary Medicine Research	2021	253-261	<a href="https://www.jocmr.com/index.php?mno=15488">https://www.jocmr.com/index.php?mno=15488</a>	<a href="https://www.jocmr.com/issue/volume=volume%2012&amp;issue=issue%202&amp;year=2021">https://www.jocmr.com/issue/volume=volume%2012&amp;issue=issue%202&amp;year=2021</a>	Chemical Abstract Services, Google Scholar, Scopus
44	Design , computational, synthesis, characterization and moplecular docking assesment of 1, 2,4-triazole moieties	Mr. V. B. Panchabhai	Pharmaceutical chemistry	International Journal of Biology, Pharmacy and Allied Sciences	2021	3785-3798	<a href="https://www.ijbps.com/">https://www.ijbps.com/</a>	<a href="https://ijbps.com/archive/archive-single-pst/4127">https://ijbps.com/archive/archive-single-pst/4127</a>	Chemical Abstract Services, Google Scholar, Scopus
45	Synthesis, characterization and molecular docking studies on some new n-substituted 2-phenylpyrido[2,3-d] pyrimidine derivatives	Mr. V. B. Panchabhai	Pharmaceutical chemistry	Research Journal of Pharmacy and Technology	2021	0974-360X	<a href="https://rjptonline.org/Home.aspx">https://rjptonline.org/Home.aspx</a>	<a href="https://www.indianjournals.com/ijor.aspx?target=ijor.rjpt&amp;volume=14&amp;issue=7&amp;article=064">https://www.indianjournals.com/ijor.aspx?target=ijor.rjpt&amp;volume=14&amp;issue=7&amp;article=064</a>	Chemical Abstract Services, Google Scholar, Scopus
46	In silico analysis of Polyphenols and Flavonoids for design of human Nav 17 inhibitors	Dr. O.G. Bhusnure	Department of Quality Assurance	Journal of Biomolecular Structure and Dynamics	2021	0739-1102	<a href="https://www.tandfonline.com/journals/tbsd20">https://www.tandfonline.com/journals/tbsd20</a>	<a href="https://www.tandfonline.com/doi/full/10.1080/07391102.2020.1777902">https://www.tandfonline.com/doi/full/10.1080/07391102.2020.1777902</a>	Scimago, Scopus
47	Formulation and Evaluation of Topical Emulgel Containing Terbinafine Hydrochloride	Dr. S.N. Nagoba	Department of Pharmaceutics	International Journal of Biology, Pharmacy and Allied Sciences(IJBPAS)	2021	2277-4998	<a href="https://www.ijbps.com/">https://www.ijbps.com/</a>	<a href="https://journalijri.com/index.php/IJRI/article/view/3876/7761">https://journalijri.com/index.php/IJRI/article/view/3876/7761</a>	ISI, SJIF, Chemical Abstract Services, Google Scholar
48	Design, Formulation and Evaluation of Cabozantinib Loaded Liposome by RP HPLC	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Pharmaceutical Research (IJPR)	2020	0975-2366	<a href="http://www.ijpronline.com">http://www.ijpronline.com</a>	<a href="#">ViewArticleDetail (ijpronline.com)</a>	Embase, CAS, ISA
49	Development & Validation of Analytical Method for Spectroscopic Estimation of Crisaborole	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Pharmaceutical Research	2020	0975-2366	<a href="http://www.ijpronline.com">http://www.ijpronline.com</a>	<a href="http://www.ijpronline.com/ViewArticleDetail.aspx?ID=22080">http://www.ijpronline.com/ViewArticleDetail.aspx?ID=22080</a>	Embase, CAS, ISA
50	Development and Characterization of Tamarindus Indica-Phospholipids Complex As An Effective Phytoconstituents Delivery System By Qbd Approach	Dr. O. G. Bhusnure	Department of Quality Assurance	Journal of Emerging Technologies and Innovative Research	2020	2349-5162	<a href="http://www.jetir.org/">http://www.jetir.org/</a>	<a href="http://www.jetir.org/archive?v=?&amp;t=3&amp;j=March%202020">www.jetir.org/archive?v=?&amp;t=3&amp;j=March%202020</a>	Google Scholar, Semantic Scholar
51	Development and Validation of RP-HPLC Method for Estimation of Etoposide in Liposomes	Dr. S.N. Nagoba	Department of Pharmaceutics	International Journal of Pharmaceutical Research	2020	0975-2366	<a href="http://www.ijpronline.com">http://www.ijpronline.com</a>	<a href="http://www.ijpronline.com/ViewArticleDetail.aspx?ID=21798">http://www.ijpronline.com/ViewArticleDetail.aspx?ID=21798</a>	Embase, CAS, ISA
52	Formulation and Evaluation of Herbal Nanoparticles Prepared From Extracts of Antidiabetic Medicinal Plants	Dr. S.N. Nagoba	Department of Pharmaceutics	International Journal of Pharmaceutical Research	2020	0975-2366	<a href="http://www.ijpronline.com">http://www.ijpronline.com</a>	<a href="https://doi.org/10.31838/ijpr/2020.12.04.677">https://doi.org/10.31838/ijpr/2020.12.04.677</a>	Embase, CAS, ISA
53	Formulation and Evaluation of Ketoprofen Loaded Nanosponges for Topical Drug Delivery	Dr. S.N. Nagoba	Department of Pharmaceutics	International Journal of Pharmaceutical Research	2020	0975-2366	<a href="http://www.ijpronline.com">http://www.ijpronline.com</a>	<a href="http://www.ijpronline.com/ViewArticleDetail.aspx?ID=23096">http://www.ijpronline.com/ViewArticleDetail.aspx?ID=23096</a>	Embase, CAS, ISA
54	Formulation and Evaluation of Liposomes Containing Sorafenib tosylate	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Medicine and Pharmaceutical Science	2020	2231-685X	<a href="https://www.ijmps.org">https://www.ijmps.org</a>	<a href="http://www.ijprc.org/publicpapers/2-51-1584357062-5IJMPSAPR20205.pdf">http://www.ijprc.org/publicpapers/2-51-1584357062-5IJMPSAPR20205.pdf</a>	Google Scholar, Crossref, SJIF, Research BiB
55	In silico analysis of marine indole alkaloids for design of adenosine A2A receptor antagonist	Dr. O. G. Bhusnure	Department of Quality Assurance	Journal of Biomolecular Structure and Dynamics	2020	0739-1102	<a href="https://www.tandfonline.com/journals/tbsd20">https://www.tandfonline.com/journals/tbsd20</a>	<a href="file:///C:/Users/comou/Downloads/InsilicoanalysisofmarineindolealkaloidsforthesignofadenosineA2Areceptorantagonist%20(1).pdf">file:///C:/Users/comou/Downloads/InsilicoanalysisofmarineindolealkaloidsforthesignofadenosineA2Areceptorantagonist%20(1).pdf</a>	Taylor and Francis
56	Formulation and Evaluation of Nano sponges Hydrogel for Topical Drug Delivery Containing Griseofulvin	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Medicine and Pharmaceutical Sciences	2020	2249-6890	<a href="http://www.ijprc.org">http://www.ijprc.org</a>	<a href="https://www.ijprc.org/publicpapers/2-51-1588072528-6IJMPSAPR20206.pdf">https://www.ijprc.org/publicpapers/2-51-1588072528-6IJMPSAPR20206.pdf</a>	Google Scholar, Crossref, SJIF, Research BiB



57	Validated RP-HPLC Method For Estimation of Apixaban in Bulk and Pharmaceutical Dosage Form	Dr. O. G. Bhusnure	Department of Quality Assurance	Journal of Emerging Technologies and Innovative Research	2020	2349-5162	<a href="https://www.jetir.org/?gad_source=1&amp;gclid=CjwKCAiA1-6sBhAoEiwArojGPqUtlXtr9DT2kpFQGuPLAZNARD-yV7VObL1fqbxGmvDCU29T_F3XfBoCg0AQAvD_BwE">https://www.jetir.org/?gad_source=1&amp;gclid=CjwKCAiA1-6sBhAoEiwArojGPqUtlXtr9DT2kpFQGuPLAZNARD-yV7VObL1fqbxGmvDCU29T_F3XfBoCg0AQAvD_BwE</a>	<a href="file:///C:/Users/compu/Downloads/JETIR/NO6014%20(1).pdf">file:///C:/Users/compu/Downloads/JETIR/NO6014%20(1).pdf</a>	Google Scholar, Semantic Scholar
58	Development and validation of RP-HPLC method for determination of Finasteride in pharmaceutical dosage form.	Dr. O. G. Bhusnure	Department of Quality Assurance	World Journal of pharmaceutical research	2020	2277-7105	<a href="https://www.wjpr.net/">https://www.wjpr.net/</a>	<a href="https://www.wjpr.net/archive_show/2020/VOLUME%20JANUARY%20ISSUE%201">https://www.wjpr.net/archive_show/2020/VOLUME%20JANUARY%20ISSUE%201</a>	Ebsco, Embase, Google Scholar, Crossref, Scopus
59	Quality by Design Based Approach for the Estimation of Telmisartan in Presence of Related Substances by RP-HPLC Method	Mr. S. B. Gholve	Department of Quality Assurance	International Journal of Pharmaceutical Research	2020	0975-2566	<a href="http://www.ijpronline.com">http://www.ijpronline.com</a>	<a href="http://www.ijpronline.com/ViewArticleDetail.aspx?ID=21782">http://www.ijpronline.com/ViewArticleDetail.aspx?ID=21782</a>	Embase, CAS, ISA
60	Design, Synthesis and Antibacterial Studies of Some New Pyridopyrimidine Derivatives as Biotin Carboxylase Inhibitors	Mr. V. B. Panchabhai	Pharmaceutical chemistry	Bulletin of Faculty of Pharmacy, Cairo University	2019	1110-0930	<a href="https://bfpc.journals.ekb.eg">https://bfpc.journals.ekb.eg</a>	<a href="https://journals.ekb.eg/article/135794_582b43d4ff9d4efb574a7135bc68608.pdf">https://journals.ekb.eg/article/135794_582b43d4ff9d4efb574a7135bc68608.pdf</a>	Google Scholar, Chemical Abstract Services
61	Development and validation of a RP-UPLC Method for Determination of Linezolid in Pharmaceutical formulation	Dr. O. G. Bhusnure	Department of Quality Assurance	Journal of Drug Delivery and Therapeutics	2019	2250-1177	<a href="https://jddtonline.info/">https://jddtonline.info/</a>	<a href="https://jddtonline.info/index.php/jddt/article/view/3072/2313">https://jddtonline.info/index.php/jddt/article/view/3072/2313</a>	Ebsco, Publons, CAS index, NLM
62	Formulate and Evaluate of Herbal Gel Containing Pomegranate Fruit Extract	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Research in Humanities, Arts and Literature	2019	2321-8878	<a href="https://www.impactjournals.us/journals/international-journal-of-research-in-humanities-arts-and-literature">https://www.impactjournals.us/journals/international-journal-of-research-in-humanities-arts-and-literature</a>	<a href="https://www.impactjournals.us/search?name=Formulate+and+Evaluate+of+Herbal+Gel+Containing+Pomegranate+Fruite+Extract&amp;type=2&amp;jtype=2&amp;submit=Search">https://www.impactjournals.us/search?name=Formulate+and+Evaluate+of+Herbal+Gel+Containing+Pomegranate+Fruite+Extract&amp;type=2&amp;jtype=2&amp;submit=Search</a>	Google Scholar, Mendeley, Index Copernicus
63	Formulation and Evaluation of Boswellia serrata resin gel by using different gelling agents	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Bio-Pharma Research	2019	2287-6898	<a href="https://www.ijbpr.net">https://www.ijbpr.net</a>	<a href="https://www.ijbpr.net/article/formulation-and-evaluation-of-boswellia-serrataresingel-by-using-different-gelling-agents.pdf">https://www.ijbpr.net/article/formulation-and-evaluation-of-boswellia-serrataresingel-by-using-different-gelling-agents.pdf</a>	Publons, Google Scholar
64	Formulation and Evaluation of fast dissolving tablets containing Amlodipine Besylate	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Bio-Pharma Research	2019	2287-6898	<a href="https://www.ijbpr.net">https://www.ijbpr.net</a>	<a href="https://www.ijbpr.net/article/formulationand-evaluation-of-fast-dissolving-tablets-containingamlodipine-besylate.pdf">https://www.ijbpr.net/article/formulationand-evaluation-of-fast-dissolving-tablets-containingamlodipine-besylate.pdf</a>	Publons, Google Scholar
65	Formulation and Evaluation of Herbal Gel containing Allium Cepa extract	Dr. S. N. Nagoba	Department of Pharmaceutics	Journal of Drug Delivery & Therapeutics	2019	2250-1177	<a href="https://jddtonline.info">https://jddtonline.info</a>	<a href="file:///C:/Users/compu/Downloads/3300-Article%20Text-9469-1-10-20190815%20(1).pdf">file:///C:/Users/compu/Downloads/3300-Article%20Text-9469-1-10-20190815%20(1).pdf</a>	Ebsco, Publons, CAS index, NLM
66	Formulation and Evaluation of Herbal Gel Containing Boswellia Serrata for Antiarthritic Activity	Dr. S. N. Nagoba	Department of Pharmaceutics	International Research Journal of Management Science & Technology	2019	2250-1959	<a href="http://www.irjms.com">http://www.irjms.com</a>	<a href="https://www.academia.edu/43412791/FORMULATION_AND_EVALUATION_OF_HERBAL_GEL_CONTAINING_BOSWELLIA_SERRATA_FOR_ANTIARTHRITIC_ACTIVITY">https://www.academia.edu/43412791/FORMULATION_AND_EVALUATION_OF_HERBAL_GEL_CONTAINING_BOSWELLIA_SERRATA_FOR_ANTIARTHRITIC_ACTIVITY</a>	Google Scholar, Scimago, Publons
67	Formulation and Evaluation of Herbal Gel containing Fenugreek Seed Extract for Nourishment and Hair Growth	Dr. S. M. Vijayendra Swamy	Department of Pharmaceutics	International Journal of Scientific Research in Science and Technology	2019	2395-6011	<a href="https://ijsrst.com/">https://ijsrst.com/</a> (link is not opening)	<a href="https://ijsrst.com/paper/5979.pdf">https://ijsrst.com/paper/5979.pdf</a>	SJIF, Crossref, Google Scholar, Publons
68	Formulation and Evaluation of Herbal Gel Containing Punica Ganatum	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Innovative Science, Engineering & Technology	2019	2348-7968	<a href="http://www.ijiset.com">http://www.ijiset.com</a>	<a href="https://ijiset.com/vol6/v6i7/IJSET_V6_I7_06.pdf">https://ijiset.com/vol6/v6i7/IJSET_V6_I7_06.pdf</a>	Scopus, Google Scholar, Thomson Reuters, Scientific indexing Services
69	Formulation and Evaluation of Herbal Gel Containing Solanum Nigrum Extract	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Scientific Research in Science and Technology	2019	2395-602X	<a href="https://ijsrst.com">https://ijsrst.com</a>	<a href="https://www.ijiset.com/paper/5978.pdf">https://www.ijiset.com/paper/5978.pdf</a>	Google Scholar, Publons, Crossref, SJIF,



70	Formulation and Evaluation of Medicated Nail Patches Containing Ketoconazole	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Research in Humanities, Arts and Literature	2019	2347-4564	<a href="https://www.impactjournals.us/journals/international-journals/international-journal-of-research-in-humanities-arts-and-literature">https://www.impactjournals.us/journals/international-journals/international-journal-of-research-in-humanities-arts-and-literature</a>	<a href="https://www.impactjournals.us/search?name=Formulation-and-Evaluation-of-Medicated-Nail-Patches-Containing-Ketoconazole&amp;style=2&amp;jtype=2&amp;submit=Search">https://www.impactjournals.us/search?name=Formulation-and-Evaluation-of-Medicated-Nail-Patches-Containing-Ketoconazole&amp;style=2&amp;jtype=2&amp;submit=Search</a>	Scribd, Mendeley, Google Scholar, IndexCopernicus, ResearchBible
71	Formulation and Evaluation of Nanoemulsion for Topical Application	Dr. S. M. Vijayendra Swamy	Department of Pharmaceutics	Journal of Drug Delivery & Therapeutics	2019	2250-1177	<a href="https://jddtonline.info">https://jddtonline.info</a>	<a href="file:///C:/Users/admin/Downloads/FORMULATION_AND_EVALUATION_OF_NANOEMULSION_FOR_TOP.pdf">file:///C:/Users/admin/Downloads/FORMULATION_AND_EVALUATION_OF_NANOEMULSION_FOR_TOP.pdf</a>	Ebsco, NLM, Google Scholar, Publons
72	Formulation and Evaluation of Transdermal Patches Containing Antidiabetic Drug	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Scientific Research in Science and Technology	2019	2395-602x	<a href="https://ijrst.com">https://ijrst.com</a>	<a href="https://ijiset.com/vol6/v6s7/IJSET_V6_I7_16.pdf">https://ijiset.com/vol6/v6s7/IJSET_V6_I7_16.pdf</a>	Google Scholar, Publons, Crossref, SJIF,
73	Preparation and Evaluation of Herbal Gel containing Fenugreek Seed Extract for Hair Growth	Dr. S. M. Vijayendra Swamy	Department of Pharmaceutics	International Research Journal of Management Science and Technology	2019	2250-1959	<a href="http://www.irjms.com/">http://www.irjms.com/</a>	<a href="https://www.academia.edu/43412723/Preparation_and_Evaluation_of_Herbal_Gel_Containing_Fenugreek_Seed_Extract_for_Hair_Growth">https://www.academia.edu/43412723/Preparation_and_Evaluation_of_Herbal_Gel_Containing_Fenugreek_Seed_Extract_for_Hair_Growth</a>	Google Scholar, Scimago, Publons
74	Synthesis And Biological Evaluation Of 2-Phenylpyrido [2,3-D] Pyrimidine Derivatives As Cyclin-Dependent Kinase (CDK) Inhibitors	Mr. V. B. Panchabhai	Pharmaceutical chemistry	Indian Drugs	2019	0019-462X	<a href="http://www.indiandrugsonline.org/">http://www.indiandrugsonline.org/</a>	<a href="https://www.indiandrugsonline.org/issuarticle-details?id=OTMx">https://www.indiandrugsonline.org/issuarticle-details?id=OTMx</a>	Ebsco, Google Scholar, Crossref, Scopus
75	Synthesis and evaluate silver nanoparticles Containing Momordica charantia Linn	Mr. A.V. Moholkar	Department of Pharmaceutics	International Journal of Bio-Pharma Research	2019	2287-6898	<a href="https://www.ijbpr.net">https://www.ijbpr.net</a>	<a href="https://www.ijbpr.net/article/synthesis-and-evaluate-silver-nanoparticles-containing-momordica-charantia-linn.pdf">https://www.ijbpr.net/article/synthesis-and-evaluate-silver-nanoparticles-containing-momordica-charantia-linn.pdf</a>	Google Scholar, Scimago, Publons
76	Pharmacognostic Standardization of Jacaranda Mimosifolia Leaves & Stem Bark	Dr. O.G. Bhushure	Department of Quality Assurance	Indian Drugs	2019	31-36	<a href="http://www.indiandrugsonline.org/">http://www.indiandrugsonline.org/</a>	<a href="https://www.indiandrugsonline.org/issuarticle-details?id=OTM4">https://www.indiandrugsonline.org/issuarticle-details?id=OTM4</a>	Ebsco, Embase, Google Scholar, Crossref, Scopus
77	Rp-HPLC Method Development and Validation for the determination of Didanosine in Pharmaceutical Dosage Form	Dr. O.G. Bhushure	Department of Quality Assurance	Journal of Drug Delivery & Therapeutics	2019	343-347	<a href="https://jddtonline.info/index.php/jddt">https://jddtonline.info/index.php/jddt</a>	<a href="file:///C:/Users/compu/Downloads/RP-HPLC_Method_Development_and_Validation_for_Determination_of_Didanosine_in_Pharmaceutical_Dosage_Form.pdf">file:///C:/Users/compu/Downloads/RP-HPLC_Method_Development_and_Validation_for_Determination_of_Didanosine_in_Pharmaceutical_Dosage_Form.pdf</a>	Ebsco, Publons, CAS index, NLM
78	Synthesis, Molecular Docking and SAR Study of Isoniazid Incorporated 2-Sulfanyloquinazoline as Novel Inhibitors of Protein Kinase B	Dr. A. N. Deshpande	Department of Pharmaceutical chemistry	International Journal of Advanced Science and Technology,	2019	2207-6360	<a href="http://sersc.org/journals/index.php/IJAST/index">http://sersc.org/journals/index.php/IJAST/index</a>	<a href="https://www.researchgate.net/publication/355846863/Design_Synthesis_and_Biological_Investigation_of_Some_Novel_Quinazolin-4(3H)-One_Tethered_1_3_4-Thiadiazole-Thiol_Motifs_as_Direct_Enoyl_Acyl_Carrier_Protein_Reductase_Inhibitors">https://www.researchgate.net/publication/355846863/Design_Synthesis_and_Biological_Investigation_of_Some_Novel_Quinazolin-4(3H)-One_Tethered_1_3_4-Thiadiazole-Thiol_Motifs_as_Direct_Enoyl_Acyl_Carrier_Protein_Reductase_Inhibitors</a>	Embase, CAS, ISA, Scopus
79	Design and Synthesis of New Aryloxy-linked Dimeric 1,2,3-Triazoles via Click Chemistry Approach: Biological Evaluation and Molecular Docking Study	Dr. O.G. Bhushure	Department of Quality Assurance	Journal of Heterocyclic Chemistry	2019	1943-5193	<a href="https://onlinelibrary.wiley.com/journal/19435193">https://onlinelibrary.wiley.com/journal/19435193</a>	<a href="https://scihub.se/10.1002/jhet.3608">https://scihub.se/10.1002/jhet.3608</a>	Scopus, Embase, Google Scholar, SCI
80	Development and Validation of HPLC method for Determination of Finasteride in Pharmaceutical Dosage Form	Dr. O.G. Bhushure	Department of Quality Assurance	World Journal of Pharmaceutical Research	2019	2277-7105	<a href="https://www.wjpr.net/">https://www.wjpr.net/</a>	<a href="https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/1580466603.pdf">https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/1580466603.pdf</a>	Ebsco, Embase, Google Scholar, Crossref, Scopus
81	Formulation and Evaluation of Traditional Antioxidant Grape Seeds Extract in the form of Tablets	Dr. O. G. Bhushure	Department of Quality Assurance	Journal of Drug Delivery and Therapeutics	2019	2250-1177	<a href="http://jddtonline.info/">http://jddtonline.info/</a>	<a href="file:///C:/Users/compu/Downloads/Formulation_and_Evaluation_of_Traditional_Antioxid.pdf">file:///C:/Users/compu/Downloads/Formulation_and_Evaluation_of_Traditional_Antioxid.pdf</a>	Ebsco, Publons, CAS index, NLM

82	UV Spectrophotometric Stability Indicating Method Development and Validation for the Determination of Finasteride Bulk and Dosage Form.	Dr. S. B. Gholve	Department of Quality Assurance	Journal of Drug Delivery & Therapeutics	2019	2250-1177	<a href="http://jddtonline.info/">http://jddtonline.info/</a>	<a href="https://jddtonline.info/index.php/jddt/article/view/3012">https://jddtonline.info/index.php/jddt/article/view/3012</a>	Ebsco, Publons, CAS index, NLM
83	Design, Development and Evaluation of Microemulgel Containing Econazole Nitrate	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Current Research	2018	0975-833X	<a href="http://www.journalcra.com">http://www.journalcra.com</a>	<a href="https://www.journalcra.com/sites/default/files/issue-pdf/31838.pdf">https://www.journalcra.com/sites/default/files/issue-pdf/31838.pdf</a>	Google Scholar, Index Copernicus, Cite Factor
84	Development and validation of uv spectroscopic method for the determination of bisoprolol fumarate tablets	Dr. O.G. Bhushure	Department of Quality Assurance	International Journal of Pharmacy and Biological Sciences	2018	2230-7605	<a href="https://www.ijpbs.com/">https://www.ijpbs.com/</a>	<a href="https://www.ijpbs.com/ijpbs-admin/upload/ijpbs_5b178cc381a01.pdf">https://www.ijpbs.com/ijpbs-admin/upload/ijpbs_5b178cc381a01.pdf</a>	Scopus, Embase, Google Scholar, SCI
85	Formulation and Evaluation of Dispersible Pellets of Lagenaria Siceraria	Dr. S. N. Nagoba	Department of Pharmaceutics	Asian Journal of Pharmaceutical Research and Development	2018	2320-4850	<a href="https://www.ajprd.com/index.php/journal">https://www.ajprd.com/index.php/journal</a>	<a href="https://www.ajprd.com/index.php/journal/issue/view/30">https://www.ajprd.com/index.php/journal/issue/view/30</a>	SCI, SJIF, Cite factor
86	Formulation and Evaluation of Elixir of Gymnema Sylvestre By Using Leaf Extract	Dr. S. N. Nagoba	Department of Pharmaceutics	Indo American Journal of Pharmaceutical Sciences	2018	2349-7750	<a href="http://www.iajps.com">http://www.iajps.com</a>	<a href="https://www.iajps.com/pdf/uly2018/49.IAJPS49072018.pdf">https://www.iajps.com/pdf/uly2018/49.IAJPS49072018.pdf</a>	Google Scholar, Index Copernicus
87	Formulation and Evaluation of Furosemide Oral Disintegrating Tablets	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Pharmaceutical Science Invention	2018	2319-6718	<a href="https://www.ijpsi.org/">https://www.ijpsi.org/</a>	<a href="http://www.ijpsi.org/Papers/Vol7(6)/A0706010110.pdf">http://www.ijpsi.org/Papers/Vol7(6)/A0706010110.pdf</a>	Google Scholar, Ebsco, Proquest, Cas
88	Formulation and Evaluation of Medicated Mouth Paint For Oral Thrush	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Pharmaceutical Science Invention	2018	2319 - 6718	<a href="http://www.ijpsi.org">http://www.ijpsi.org</a>	<a href="https://ijpsi.org/Papers/Vol7(6)/D0706012427.pdf">https://ijpsi.org/Papers/Vol7(6)/D0706012427.pdf</a>	Google Scholar, Ebsco, Proquest, Cas
89	Formulation and Evaluation of Medicated Nail Patches for the Treatment of Onychomycosis	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Pharmaceutical Science Invention	2018	2319 - 6718	<a href="https://www.ijpsi.org">https://www.ijpsi.org</a>	<a href="http://www.ijpsi.org/Papers/Vol7(4)/I0704015258.pdf">http://www.ijpsi.org/Papers/Vol7(4)/I0704015258.pdf</a>	Google Scholar, Ebsco, Proquest, Cas
90	Formulation and evaluation of oral fast dissolving film of gabapentin by QbD approach	Dr. O.G. Bhushure	Department of Department of Department of Quality Assurance	International Journal of Pharmacy and Biological Sciences	2018	2230-7605	<a href="https://www.ijpbs.com/">https://www.ijpbs.com/</a>	<a href="https://www.ijpbs.com/ijpbs-admin/upload/ijpbs_5b179b9926c18.pdf">https://www.ijpbs.com/ijpbs-admin/upload/ijpbs_5b179b9926c18.pdf</a>	Scopus, Embase, Google Scholar, SCI
91	Formulation and Evaluation of Oral Fast Dissolving Sublingual Film of Propranolol HCl	Mr. S. B. Gholve	Department of Quality Assurance	International Journal of Pharma Research and Health Science	2018	2348-6465	<a href="http://www.pharmahealthscience.net/">http://www.pharmahealthscience.net/</a>	<a href="https://www.researchgate.net/profile/Dr-Omprakash-Bhushure/publication/325013107_Formulation_and_Evaluation_of_Oral_Fast_Dissolving_Sublingual_Film_of_Propranolol_HCl/links/5af18c5e458515c283755379/Formulation-and-Evaluation-of-Oral-Fast-Dissolving-Sublingual-Film-of-Propranolol-HCl.pdf">https://www.researchgate.net/profile/Dr-Omprakash-Bhushure/publication/325013107_Formulation_and_Evaluation_of_Oral_Fast_Dissolving_Sublingual_Film_of_Propranolol_HCl/links/5af18c5e458515c283755379/Formulation-and-Evaluation-of-Oral-Fast-Dissolving-Sublingual-Film-of-Propranolol-HCl.pdf</a>	Index Copernicus, NCBI, CAS, Scopus
92	Formulation and Evaluation of Transdermal Patches of Nicorandil by Using Different Penetration Enhancer	Dr. S. N. Nagoba	Department of Pharmaceutics	International Journal of Pharmacy and Pharmaceutical Research	2018	2349-7203	<a href="https://ijppr.humanjournals.com">https://ijppr.humanjournals.com</a>	<a href="https://ijppr.humanjournals.com/wp-content/uploads/2018/08/14_Bondar-Ganesh-H.-Nagoba-Shivappa-N.-Sarukh-Vikram-S.-Shaikh-Nasheer-S..pdf">https://ijppr.humanjournals.com/wp-content/uploads/2018/08/14_Bondar-Ganesh-H.-Nagoba-Shivappa-N.-Sarukh-Vikram-S.-Shaikh-Nasheer-S..pdf</a>	Index Copernicus, NCBI, Pubmed, CAS
93	Formulation, Development and Evaluation of Microemulgel for Topical Application	Dr. S. N. Nagoba	Department of Pharmaceutics	Asian Journal of Science and Technology	2018	0976-3376	<a href="https://www.journalajst.com/">https://www.journalajst.com/</a>	<a href="http://www.journalajst.com/formulation-development-and-evaluation-microemulgel-topical-application">http://www.journalajst.com/formulation-development-and-evaluation-microemulgel-topical-application</a>	SJIF, Cosmos, Root indexing
94	Hepatoprotective activity of ethanolic extract of <i>gardenia resinifera</i> roth. Leaf in ccl4 induced hepatotoxicity	Mr. S. S. Hindole	Pharmacognosy	World Journal of Pharmacy and Pharmaceutical Sciences	2018	2278-4357	<a href="https://www.wjpps.com/">https://www.wjpps.com/</a>	<a href="https://storage.googleapis.com/journal-uploads/wjpps/article_issue/1538221905.pdf">https://storage.googleapis.com/journal-uploads/wjpps/article_issue/1538221905.pdf</a>	Ebsco, Embase, Scopus, Google Scholar, CAS
95	Attenuation of neuropathic pain by Lacosamide in an experimental model of chronic constriction injury in Rats	Ms. P. S. Giram	Department of Pharmacology	International Journal of Pharmacy and Biological Sciences	2018	2321-3272		<a href="https://www.ijpbs.com/ijpbs-admin/upload/ijpbs_5b22b18d67e3e.pdf">https://www.ijpbs.com/ijpbs-admin/upload/ijpbs_5b22b18d67e3e.pdf</a>	Scopus, Embase, Google Scholar, SCI



96	Multiple response optimization of processing and formulation parameters of pH sensitive sustained release pellets of capecitabine for targeting colon	Dr. S. M. Vijayendra Swamy	Department of Pharmaceutics	Journal of Microencapsulation	2018	0265-2048	<a href="https://www.tandfonline.com/journals/imnc20">https://www.tandfonline.com/journals/imnc20</a>	<a href="https://www.tandfonline.com/doi/abs/10.1080/02652048.2018.1465138?journalCode=imnc20">https://www.tandfonline.com/doi/abs/10.1080/02652048.2018.1465138?journalCode=imnc20</a>	Scopus, Embase, Google Scholar, SCI
97	Pharmacognostic and phytochemical evaluation of leaves of gardenia resinifera roth	Mr. S. S. Hindole	Pharmacognosy	International journal of Pharmacognosy	2018	2348-3962	<a href="https://ijjournal.com/">https://ijjournal.com/</a>	<a href="https://storage.googleapis.com/journal-uploads/wjpps/article_issue/1535792455.pdf">https://storage.googleapis.com/journal-uploads/wjpps/article_issue/1535792455.pdf</a>	Scopus, Google Scholar, Cite factor, index Copernicus
98	Diosmin Phytosomes: Development, Optimization and Physicochemical Characterization	Dr. O.G. Bhushure	Department of Quality Assurance	Indian Journal of Pharmaceutical Education and Research	2018	0019-5464	<a href="https://www.ijper.org/articles/default/files/IndJPhaEdRes_52_4-s29.pdf">https://www.ijper.org/articles/default/files/IndJPhaEdRes_52_4-s29.pdf</a>	<a href="https://www.ijper.org/sites/default/files/IndJPhaEdRes_52_4-s29.pdf">https://www.ijper.org/sites/default/files/IndJPhaEdRes_52_4-s29.pdf</a>	Web of Science, Google Scholar, Scopus, ABC Chemistry
99	Effect of Lacosamide in Streptozotocin induced Diabetic Neuropathic Pain	Ms. P. S. Giram	Department of Pharmacology	International Journal of Pharmacy and Biological Sciences	2018	2230-7605	<a href="https://www.ijpbs.com/">https://www.ijpbs.com/</a>	<a href="https://www.ijpbs.com/ijpbsadmin/upload/ijpbs_5b22ef14ed0a6.pdf">https://www.ijpbs.com/ijpbsadmin/upload/ijpbs_5b22ef14ed0a6.pdf</a>	Scopus, Embase, Google Scholar, SCI
100	Qbd Approach for Analytical Method Development and Validation of Bisoprolol Fumarate By Spectroscopic Method	Dr. O.G. Bhushure	Department of Quality Assurance	International Journal of Pharmacy and Biological Sciences	2018	2230-7605	<a href="https://www.ijpbs.com/">https://www.ijpbs.com/</a>	<a href="https://ijpbs.com/ijpbsadmin/upload/ijpbs_5bb106b4115fb.pdf">https://ijpbs.com/ijpbsadmin/upload/ijpbs_5bb106b4115fb.pdf</a>	Scopus, Embase, Google Scholar, SCI
101	Stability Indicating High Performance Thin-Layer Chromatography Method For Simultaneous Estimation of Ambroxol Hydrochloride and Loratadine In Pharmaceutical Dosage Form	Dr. R. S. Sakhare	Department of Quality Assurance	Indian Drugs	2018	0019-462X	<a href="https://www.indiandrugsonline.org">https://www.indiandrugsonline.org</a>	<a href="https://www.researchgate.net/publication/327540054_Stability_indicating_high_performance_thin-layer_chromatography_method_for_simultaneous_estimation_of_ambroxol_hydrochloride_and_loratadine_in_pharmaceutical_dosage_form">https://www.researchgate.net/publication/327540054_Stability_indicating_high_performance_thin-layer_chromatography_method_for_simultaneous_estimation_of_ambroxol_hydrochloride_and_loratadine_in_pharmaceutical_dosage_form</a>	Ebsco, Embase, Google Scholar, Crossref, Scopus



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# **Research Paper Publication From Year 2022 to 2018**

**Title of the Paper:**  $\alpha$ -Amylase Inhibitory Property of major phytoconstituents of polyherbal formulation: An In-Vitro and Molecular Interaction Study

**Name of Author:** Dr. O. G. Bhusnure

**Name of the Journal:** Bulletin of Environment, Pharmacology and Life Sciences

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ORIGINAL ARTICLE

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### **$\alpha$ -Amylase Inhibitory Property of major phytoconstituents of polyherbal formulation: An In-Vitro and Molecular Interaction Study**

Shivakumar S. Ladde<sup>1</sup>, Bhusnure O. G<sup>2\*</sup>

<sup>1</sup>Research Scholar, Channabasweshwar Pharmacy College, Latur- 413512, Affiliated to SRTMU, Nanded Maharashtra, India

<sup>2</sup>Dept. of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Latur- 413512, Maharashtra, India, Email: shivkumarladde@gmail.com

\*Corresponding Author

#### ABSTRACT

The  $\alpha$ -amylases are enzymes that hydrolyse starch molecules to allow numerous merchandises as well as dextrans and increasingly smaller polymers composed of aldohexose units that causes hyperglycaemia and also the development of type 2 DM. Presently Acarbose may be an advanced saccharide want to lower plasma aldohexose levels by inhibiting the absorption of aldohexose by the internal organ. The foremost common adverse effects are GI symptoms, as well as flatulence, diarrhea, abdominal pain, and elevated body fluid transaminases might occur throughout acarbose medical aid. The event of inhibitors from natural merchandise offers another possibility for the management of hyperglycaemia. Therefore, the current study has been conducted screening of alpha-amylase repressing activity through in-vitro alpha amylase inhibitory effect and molecular docking of some commonly used nutraceuticals. The polyherbal formulation PHF<sub>2</sub> shows the highest  $\alpha$ -amylase inhibition effect as compared to Voglibose, polyherbal formulation PHF<sub>1</sub>, and PHF<sub>3</sub>. Also, all polyherbal formulations illustrate a major synergistic impact as compared to individual extracts. Also in the Silico drug analysis model, the major phytoconstituents of *A. Sativum*, *P. Granatum*, *Z. Officinale*, and *S. Cumini* used in the preparation of this polyherbal formulation show significant inhibitory interactions with the human pancreatic  $\alpha$ -amylase enzyme.

**Keywords:** Human pancreatic  $\alpha$ -amylases, Polyherbal Formulation, Diabetes Mellitus, Molecular Docking

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#### INTRODUCTION

Diabetes mellitus (DM) may be a chronic, metabolic illness characterised by elevated blood sugar levels, that leads over time to serious harm to the heart, blood vessels, eyes, kidneys, and nerves. the foremost common is kind a pair of polygenic disease (TZDM), sometimes in adults, that happens once the body becomes proof against endocrine or does not create enough endocrins, regarding 422 million folks worldwide have polygenic disease, the bulk living in low-and middle-income countries, and 1.5 million deaths are directly attributed to polygenic disease every year, each the quantity of cases and also the prevalence of polygenic disease are steady increasing over the past few decades [1, 2, 11]. Several body fluid enzymes activities related with DM are often classified into four groups: Cluster I: Lysosomal enzyme-like  $\beta$ -glucuronidase N-acetyl- $\beta$ -glucosaminidase, acid enzyme, and enzyme, these protein activities is also magnified with magnified glucose concentration. Cluster II: Alkaline Phosphatase and Trehalase, that are magnified however not related with glucose concentration, however might replicate with tissue metabolic disorders. Cluster III: Phosphohexose isomerase, Aminotransferases, and several other dehydrogenases, these protein activity will increase just in case of tissue harm caused by metabolic and circulatory alterations, enzyme, on the opposite hand, is cut. Cluster IV: Enzymes embrace the preceding enzymes with different enzymes, these are a lot of active in diabetics with complications like internal organ and excretory organ involvement and obesity [3, 12]. The  $\alpha$ -amylases are enzymes that hydrolyse starch molecules to allow numerous merchandises as well as dextrans and increasingly smaller polymers composed of aldohexose units that causes hyperglycaemia and also the development of type 2 DM [4, 13].



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**Title of the Paper:** Design Development and Characterization of Polyherbal Gel Containing Hair Rejuvenating Herbs.

**Name of Author:** Dr. S. N. Nagoba

**Name of the Journal:** Asian Journal of Organic and Medicinal Chemistry

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UGC CARE APPROVED JOURNAL

### **Design Development and Chraterization of Polyherbal Gel Containing Hair Rejuvenating Herbs**

**Wadde Malika Sharnappa, Nagoba Shivappa N<sup>†</sup> and Swami Avinash B**

Department of Pharmaceutics, Channabasweshwar Pharmacy College (Degree), Latur, Maharashtra, India

#### **ABSTRACT**

The objective of the present research work was to develop polyherbal gel containing four different hair rejuvenating herbs i.e. **Bhringraj** (Eclipta Alba) family: Astraceae as a "KING OF HAIR" for rejuvenating quality, **Brahmi** (B. monnieri) family: Scrophulariaceae as antimicrobial, **Amla** (Embilca officinalis) Indian Gooseberry enriched of vitamin C provide boosted nutritional quality, promote hair growth and **Fenugreek** (Trigonella Foenum Graecum) family: Fabaceae used as hair tonic. The polyherbal gel is formulated using various excipients such as gelling agents like Carbapol 934, and Xanthan Gum, methyl paraben as preservative, polyethylene glycol (PEG) as penetration enhancer, PVP as stabilizer, triethanolamine to adjust the pH, glycerin as humectant and water are used as solvent. The prepared gel was subjected for physical evaluation i.e., color, appearance, spreadability, pH, viscosity, In-vitro diffusion study, FT-IR study and stability study. Based on results batch F6 was found best stable polyherbal gel.

**Keywords:** Brahmi, Amla, Fenugreek, Bhringraj, In-vitro diffusion study, Stability study

#### **INTRODUCTION**

Traditionally, hair loss was treated with the topical application of different herbal remedies, which were a result of long years of observation and painstaking effort by holistic practitioners. In traditional Indian system of medicine many plants and herbal formulations are reported for hair growth promotion as well as improvement of quality of hair, but lack of sound scientific backing and information limits their use. In present study, the main objective is to formulate and evaluate polyherbal gel containing hair rejuvenating herbs for hair growth activity which can overcome the problems of hair in a natural way.

Herbs chosen for the study are Bhringraj, Brahmi, Amla and Fenugreek. Plants are selected for this purpose on the basis of their reported activity i.e. Emblica officinalis and Trigonella have antioxidant activity, anti-lice, antidandruff activity as well as hair growth and soothing effects, which promote hair follicle formation whereas Ecliba Alba show antimicrobial activity because it contain coumestans like wedelolactone, desmethylwedelolactone, furanocoumarins, oleanane and taraxastane glycosides. So main objective is to formulate and evaluate the polyherbal gel containing hair rejuvenating herbs for hair growth activity which can overcome the problems of hair in a natural way as synergistic effect.

#### **MATERIALS AND METHODS**

The herbal drugs Bhringraj, Brahmi, Amla and Fenugreek are obtained from 'Vital Herbs'. Carbapol 934, Xanthan gum, Glycerin, PVP, Methyl paraben, Polyethylene glycol, Triethanolamine were received from Loba chemie laboratory, Vikas pharma, Goregaon, Hi media Laboratories, Ozone international Mumbai, Molychem, Mumbai respectively. All other ingredients used were of analytical grade.

#### **PREFORMULATION STUDY**

##### **Organoleptic Characteristics**

All drugs were tested visually for its physical appearance.

##### **Solubility Study**

Solubility of all drugs was tested in the various solvents (water, methanol, ethanol, etc) at room temperature by adding additional amount of drugs in solvent till supersaturation.

##### **Spectroscopic Study**

All drugs have been calibrated using UV spectroscopy individually and based on this one isocratic point was chosen further to carry out drug analysis as we have developing polyherbal gel.

##### **FTIR Study**

Drug excipient compatibility study was conducted using FTIR. Combination of all drugs and excipients was taken in 1:1 ratio and tested twice taking 1 month gap in between. Results were observed for any interaction.





Title of the Paper: Design, Development and Evaluation of Honey Loaded Microsponges

Name of Author: Dr. S. M. Vijayendra Swamy

Name of the Journal: Bulletin of Environment, Pharmacology and Life Sciences.

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## Design, Development and Evaluation of Honey Loaded Microsponges

Khadkutkar Vijayananda K.<sup>1</sup>, Vijayendra Swamy S. M.<sup>1</sup>, Wanje Vajjanti V.<sup>1</sup>, Nagoba Shivappa N.<sup>1,\*</sup>

<sup>1</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

Email: [vijayendraswamy@yahoo.com](mailto:vijayendraswamy@yahoo.com)

\*Corresponding Author

### ABSTRACT

Microsponges are polymeric delivery systems composed of porous microspheres. They are tiny sponge-like spherical particles with a large porous surface. Moreover, they may enhance stability, reduce side effects and modify drug release favourably. Microsponges are porous, polymeric microspheres that are used mostly for topical use and have recently been used for oral administration. Microsponges are designed to deliver a pharmaceutical active ingredient efficiently at the minimum dose and also to enhance stability, reduce side effects, and modify drug release. Microsponges gel may increase the solubility, permeability and efficacy of poorly soluble drugs. Emulsion solvent diffusion method was adopted for preparation of Microsponges which provides ease of formulation. Preparation of honey loaded microsponges was prepared by using different formulations, from which F9 formulation was optimized. In vitro permeation of Manuka honey was studied by using dialysis membrane, through which Manuka honey is release in controlled and sustain manner. Formulation variables namely concentration of EC and PVA significantly affect the rate and extent of permeation of Manuka honey from Microsponge gel. Honey loaded Microsponges drug delivery is safe and effective delivery for ocular delivery of poorly soluble and poorly permeable drug to treat bacterial corneal ulcer.

**Keywords:** Drug delivery, microsponges, PVA, bacterial corneal ulcer.

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### INTRODUCTION

The Microsponge Delivery System (MDS) is a porous, polymeric microspheres system used for prolonged administration. They are tiny sponge like spherical particles that made of number of interconnecting spaces between a non-collapsible structure with a large porous surface through which active ingredient are released in a controlled manner. The outer surface is porous, allowing a sustained flow of substance out of the sphere [1]. Microsponges show acceptable stability over pH ranging from 1 to 11 and at high temperatures i.e up to 130°C. The microsponge technology was developed by Won in 1987 and the original patents were assigned to advanced polymer system. The size of microsponge ranges from 5-300 µm in diameter and a typical 25 sphere can have up to 25000 pores and an internal pore structure [2-4]. The microsponges are having capacity to entrap wide range of pharmaceutical active ingredients such as fragrances, essential oils, sunscreens, emollients and anti-infective which serve to be a topical drug delivery system. Finally the use of the porous microsponges with addition to active ingredients can be formulated into various dosage forms such as creams, lotions and powders.<sup>2</sup> Microsponges are prepared by several methods as emulsion systems and liquid-liquid suspension polymerization methods. Emulsion systems include water in oil in water (w/o/w) emulsion solvent diffusion, oil in oil emulsion solvent diffusion and quasi emulsion solvent diffusion (ESD) method. Quasi emulsion solvent diffusion (ESD) method is the most common emulsion system used with microsponges preparation [3, 5]. Microsponge delivery systems are used to enhance the safety, effectiveness and aesthetic quality of topical prescription, over-the-counter and personal care products. It offers the formulator a range of alternatives to develop drug and cosmetic products. Microsponges are designed to deliver a pharmaceutical active ingredient efficiently at the minimum dose and also to enhance stability, reduce side effects and modify drug release [6-10]. The aim of present investigation was to design, development and evaluation of honey loaded microsponge gel for treatment of bacterial corneal ulcer



  
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Title of the Paper: Design, Development and Evaluation of Liposomes Containing Anticancer Drug

Name of Author: Dr. S. N. Nagoba

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Krishna B. Bhansali et al / Design, Development and Evaluation Of Liposomes Containing Anticancer Drug



## Design, Development and Evaluation of Liposomes Containing Anticancer Drug

Krishna B. Bhansali<sup>1</sup>, Nagoba Shivappa N.<sup>2\*</sup>

### Abstract

The aim of the present study is to design, develop and evaluate the liposomal drug delivery system for anticancer drug Ibrutinib. It belongs to BCS Class IV category which exhibits insufficient aqueous solubility and permeability, thereby limiting its oral absorption. Liposomes are small vesicles that are prepared by utilizing cholesterol and nontoxic phospholipids from natural sources. The objective of the study is to prepare Ibrutinib liposomes which provide targeted delivery of drug. Liposomes were prepared using Soyabeanphosphotidylcholine, cholesterol, methylated poly-ethylene glycol, and organic solvent by thin film hydration method using QbD approach. All batches were evaluated for entrapment efficiency (58-72%), polydispersity index (0.255-0.598), particle size (237.4-436.3nm) and zeta potential (-32.7 to -47.8mV). Amongst all optimized batch IL4 was only subjected to % in vitro drug diffusion, surface topography, MTT assay and pharmacokinetic study, as well as stability study. Liposomes were stable at 5°C±2°C.

**Key Words:** Ankylosing Spondylitis, HLA-B27, Functional Status, Disease Activity

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### Introduction

In the last decade the risk of increased occurrence of cancer and worldwide prevalence to society, it has posed a great challenge to the health care scientist and professionals. Easily accessible cancer treatments include surgery, chemotherapy and radiotherapy, etc. however these treatments cannot assure complete cure of cancer; this opportunity has providing wide scope to develop new treatment and delivery system which is safe, effective and more promising than established treatment and it can be more impactful with scope of continuous improvement in way of treatment. At present, the limiting factors in cancer drug delivery are the lack of drug selectivity against cancer cells, narrow therapeutic index, development of multidrug resistance (Pgp substrate), poor aqueous solubility and low permeability, GI instability, pre-systemic metabolism etc.1-2

The aim of the study was to develop and characterize the novel liposomal drug delivery system for anticancer drug to improve its bioavailability and its efficacy. Ibrutinib belongs to BCS Class IV category which exhibits insufficient aqueous solubility and permeability, thus it limiting in oral absorption and poor in pharmacokinetic. Liposomes are small vesicles with coating of polyethylene glycol, that are prepared by utilizing cholesterol and nontoxic phospholipids from natural sources.

Liposome is one of the most widely explored areas in NDDS as the application are more in compared with other treatments. It also carries both hydrophilic and lipophilic type of drugs in one closed vesicle. The use of phospholipid and cholesterol facilitates higher encapsulation, targeting ability, low toxicity, and primarily its feasibility to produce at the industrial level.

**Corresponding author:** Nagoba Shivappa N.

**Address:** <sup>1</sup>School of Pharmacy, Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra, India, <sup>2</sup>Professor and Head, Department of Pharmaceutics, Channabasweshwar Pharmacy College, Kava Road, Latur-413512, Dist. Latur, (MS)

E-mail:

nagobashivraj@gmail.com nshivraj11@rediffmail.com



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## Dielectric Constant, Density, and Refractive Index in Binary Mixtures of Ethanol with N,N-Dimethylformamide at 293.15 K

CHEMICAL THERMODYNAMICS AND THERMOCHEMISTRY Published: 25 May 2022

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**Russian Journal of Physical Chemistry A**[Aims and scope](#)[Submit manuscript](#)[A. V. Navarkhele, R. S. Sakhare, S. M. Vijayendraswamy & V. V. Navarkhele](#) 154 Accesses 1 Citation [Explore all metrics](#) →[Cite this article](#)**Abstract**

Experimental static dielectric constants, densities and refractive indices at 293.15 K temperature are reported for the binary liquid mixtures of ethanol with N,N-dimethylformamide (DMF) over entire volume fraction range. From the experimental dielectric data, excess dielectric constant, Kirkwood correlation factor, Bruggeman factor are estimated and reported in the study. From density and refractive index data various



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**Title of the Paper:** Evaluation of the hypolipidemic activity of Polyherbal formulation through In-vivo and Insilico studies

**Name of Author:** Mr. S. S. Ladde

**Name of the Journal:** International Journal of Health Sciences

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## **Evaluation of the hypolipidemic activity of polyherbal formulation through In-vivo and In-silico studies**

**Shivakumar S. Ladde**

Research Scholar, Channabasweshwar Pharmacy College, Latur- 413512, Affiliated to SRTMU, Nanded Maharashtra, India

\*Corresponding author email: shivkumarladde@gmail.com

**Bhushure O. G.**

Dept. of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Latur- 413512, Maharashtra, India

**Abstract**--Obesity is one of the most important public health issues touching every region of the world. Currently, India is facing the double burden of undernutrition likewise as overnutrition. There are >135 million those that are obese in India. Hyperlipidaemia is related to risk factors like arteriosclerosis, hypertension, type-II DM, obesity, MI, congestive cardiac failure, angina pectoris, gall bladder diseases, degenerative joint diseases, apnea, and sterility. The present treatment for hyperlipidaemia is Cholesterol-lowering medications may cause life-threatening serious unwanted effects many facet effects, such as muscle pain, exaggerated glucose levels, constipation, nausea, diarrhea, abdomen pain, cramps, the elevation of liver enzymes. Therefore, the present investigation was designed to investigate the hypolipidemic activity of polyherbal formulation in Wistar rats in an endeavour to determine the traditional use of this Polyherbal formulation and Insilco molecular docking studies. Hypolipidemic effect of polyherbal formulation was studied in the High Cholesterol cocktail diet (HCCD) fed hyperlipidemic rat model and Insilco Molecular docking studies of hHMG Co-A reductase (PBD:1hwk) and analysis of ligand-protein interactions for the prediction of the mechanism of hypolipidemic activity of important phytoconstituents of the polyherbal formulation. The polyherbal formulation to control shows a major reduction in total cholesterol, lipid, LDL-cholesterol, VLDL-cholesterol and elevates the helpful lipid-like HDL-cholesterol and In silico studies, the ligand-protein interaction analysis revealed that Ellagic Acid, Rutin, Myricetin, Quercetin, Kaempferol, Gingerenone, 6-Shogaol, 6-Gingerol, Gallic Acid, and Alliin molecules shows binding energy near to reference



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**Title of the Paper:** Formulation and Evaluation of Green tea extract Niosomal Gel for Acne Vulgaris

**Name of Author:** Dr. S. N. Nagoba

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UGC CARE APPROVED JOURNAL

### Formulation and Evaluation of Green Tea Extract Niosomal Gel for Acne Vulgaris

Mundhe Renuka M<sup>1</sup>, Nagoba Shivappa N<sup>2\*</sup>, Vattamwar Gauri S<sup>3</sup>, Waghmare Kanchan R<sup>1</sup>, Awale Sumit R<sup>5</sup>, Jadhav Pawan P<sup>6</sup>, Kalburge Mayuri V<sup>7</sup>, Bhosale Sujata B<sup>8</sup> and Shaikh Saif S<sup>9</sup>

<sup>1,2,3,4,5,6</sup>Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India

<sup>7,8</sup>Department of Pharmaceutical Quality Assurance, Channabasweshwar Pharmacy College, Latur, Maharashtra, India

<sup>9</sup>Department of Pharmaceutics, Y. B. Chavan College of Pharmacy, Aurangabad, Maharashtra, India

#### ABSTRACT

The present study was to formulate and evaluate the green tea extract loaded niosomal gel using different grades of surfactants such as span and tween for the preparation of niosomes. The main objective of the study was to enhance the antioxidant activity of the formulation. The green tea extract contains polyphenolic compounds such as catechins (30% to 40%) which shows three different activities such as antioxidant, anti-inflammatory and antibacterial activity which are beneficial for the treatment and management of different grades of acne and reduction of lesion count. The standardization of green tea extract sample was done using TLC plate method. Niosomes were prepared by Thin-layer hydration method. Niosomes are prepared with different ratios of drug: cholesterol: surfactant (1:1:2, 1:1:3). The all niosomal dispersion was evaluated for entrapment efficiency, drug content, in-vitro drug release. F6 batch is considered as optimized with in-vitro drug release (71.95 for 12 hr), entrapment efficiency (81.31), drug content (89.74) which is converted to gel. Optimized batch were also evaluated for surface morphology and charge behaviour of done Scanning electron microscopy (SEM), Zeta-potential. Niosomal gel was evaluated for spreadability, viscosity, drug content, Niosomal gel was prepared using Carbopol 934 (0.5%), HPMCK15 (0.5%), propylene glycol, triethanolamine, glycerol and distilled water. The niosomal gel was also evaluated for its antioxidant activity with the help of DPPH test used ascorbic acid as positive control, the niosomal gel showed 51.01% DPPH radical scavenging activity. Optimized batch were subjected for stability study.

Keywords: Niosome, Green tea extract, TLC, Span, Tween, SEM, Zeta-potential, DPPH.

#### 1. INTRODUCTION

Drug delivery system DDS is a new advanced system of drug delivery now a days. It consists of Nano particles liquid crystal vesicles which are biocompatible and produces higher efficiency by helping reduction in development of new drugs. DDS also helps to reduce the problems associated with the drugs. Niosomes are vesicles formed by self-assembly of non-ionic surfactant, they are vesicular delivery systems which are formed via aqueous dispersion of non-ionic surfactant films. The basic process of preparation is the same i.e. hydration by aqueous phase of the lipid phase which may be either a pure surfactant or a mixture of surfactant with cholesterol. Reducing the size of drug carriers to a nanoscale has many benefits including: (1) improving the pharmacokinetics and biodistribution of therapeutic agents, (2) reducing toxicity by accumulation of the drug in the target site, (3) facilitating drug passage between the cells and (4) increasing their retention time in biological systems that increase the efficacy of the drug.

Niosomes are preferred over other bilayer structures due to chemical stability. Bio-degradability, biocompatibility. Low production cost, low toxicity, and easy storage and handling. Acne vulgaris in patients may start during adolescence and persist or have onset in adulthood. Acne has various psychosocial effects that impact patients is quality of life. Plant extracts have been widely used as topical applications for various skin conditions, the EGCG is a potent antioxidant found in green tea extract (camellia sinensis). EGCG received increased attention because of its anti-inflammatory, anti-microbial properties which are beneficial for the treatment of acne vulgaris but due to its hydrophilic nature it has low skin permeation. To overcome this problem the use of nanocarriers such as niosomes one of the best option as it has vesicular system which helps to transfer the hydrophilic as well as lipophilic moieties across the skin membranes. It also increases the retention time of active substances on the stratum corneum and epidermis solving the problem of penetration of active substance. It also increases the retention time of active substances on the stratum corneum and epidermis solving the problem of penetration of active substance. These may act depot to controlled release of drug to give effective action for longer duration because of which the frequency of application may reduce.

#### 2. MATERIALS

Green tea extract was gift sample from SA Herbal Bioactives LLD, M.P. Cholesterol was obtained from Research lab & Chem. Industries Mumbai. Span and tween from Lobachem, Mumbai. Dichloromethane,



**Title of the Paper:** Formulation and Evaluation of 6- Mercaptopurine Loaded-Lipid-Polymer hybrid Nanocarrier

**Name of Author:** Dr. S. N. Nagoba

**Name of the Journal:** Asian Journal of organic and Medicinal Chemistry

### Formulation and Evaluation of 6-Mercaptopurine Loaded Lipid-Polymer Hybrid Nanocarrier

Dande Pradnyarani A, Nagoba Shivappa N<sup>\*</sup>, Swami Avinash B, Sayyad Firdos J, Waghmare Kanchan R, Sayyed Simakousar N and Jaishatte Arti A

Department of Pharmaceutics, Channabasweshwar Pharmacy College (Degree), Latur, Maharashtra, India

#### ABSTRACT

The purpose of the present study is to formulate and evaluate 6-mercaptopurine loaded Lipid-Polymer Hybrid Nanocarrier (LPHNC) for site specific drug delivery. 6-mercaptopurine is a purine antagonist it inhibits DNA synthesis by inhibiting purine containing nucleotides. Firstly, 4 batches of LPHNCs were prepared by employing single step emulsion solvent evaporation method consisted of drug, polycaprolactone (PCL), Hydrogenated soya phosphatidylcholine (HSPC), soya lecithin, Poloxamer 188, organic solvent. All batches evaluated for %EE, drug content, in-vitro drug release and on the basis of this F2 batch was found to be optimized batch. The optimized batch was also subjected for SEM, Zeta potential and accelerated stability study.

**Keywords:** 6-Mercaptopurine, LPHNCs, HSPC, in-vitro drug release, accelerated stability study

#### 1. INTRODUCTION

The use of cytotoxic drugs in their free form to inhibit cell division of cancer cells or to kill cancer cells i.e. chemotherapy still remains the choice of treatment in cancer. Although the anticancer agents have improved patient survival rate, their treatments are not effective enough due to non-specific toxicity, unfavorable pharmacokinetics, less bioavailability, dose dependent side effects etc. Due to these threats, nanocarriers have been attempted for cancer therapy as quite encouraging systems. In last decades, nanotechnology has emerged as most promising tool in the pharmaceutical field for development of novel drug carrier system providing versatile clinical application and scale-up for industrial production. Lipid and polymer nanocarriers are two different drug delivery systems which have been approved by US FDA for clinical use.

Lipid nanocarriers are biocompatible, biodegradable, harmless or less toxic and non-immunogenic. However, Lipid nanocarriers have some drawbacks like physical and chemical instability during storage and content leakage. The polymer nanocarriers provides stability in biological fluids and during storage, ability to offer some limitations like polymer cytotoxicity, less biocompatibility. Recently, Lipid and polymer based nanocarriers have been merged together to integrate the benefits and to overcome the possible drawbacks of both of them and developed a newer system namely Lipid-Polymer Hybrid Nanocarrier (LPHNCs). LPHNCs has overcome the drawbacks like content leakage, toxicity and provide benefits like controlled drug release, stability during storage, increased circulation time and bioavailability. 6-mercaptopurine is a purine antagonist it interfere with DNA of cancerous cell and stops the cell division at S phase, it is used in treatment of Leukemia. But it's poor aqueous solubility and permeability limits the clinical application of 6-mercaptopurine. This problem might be overcome by use of LPHNC.

#### MATERIALS AND METHODS

##### A. Materials

6-Mercaptopurine was purchased from HiMedia Laboratories Pvt. Ltd., Thane, Hydrogenated Soya Phosphatidylcholine(HSPC), soya lecithin was gifted by lipidome Lifesciences, Gujrat, Polycaprolactone received from Biochemika, other reagents used were analytical grade.

##### B. Methods

###### 1. Preformulation:

###### Physical appearance of drug

6-mercaptopurine was observed for colour, odour, nature etc.

###### Solubility study

The solubility of drug was determined by adding an excess amount of drug to test tube containing 2ml of solvents (water, warm ethanol, PBS 6.8) and kept at room temperature for 24hrs.

###### Estimation of 6-mercaptopurine by UV spectroscopy method

For stock solution, 10 mg quantity of 6-mercaptopurine was dissolved in warm ethanol and volume made up to 100ml with PBS 6.8 in 100 ml volumetric flask to obtain 100µg/ml solution. From this, aliquots of 0.2, 0.4, 0.6,

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## Channabasweshwar Pharmacy College (Degree)

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Phone No. (02382) 240192, Fax-(02382) 243855

Email- [channabasweshwar@gmail.com](mailto:channabasweshwar@gmail.com) Website- [www.cdphl.org](http://www.cdphl.org)

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### Formulation and evaluation of carbon nanotubes for topical drug delivery

**Sakhare Raghunath S.**

Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India

**Nagoba Shivappa N.**

Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India  
Corresponding author email: [nagobashivraj@gmail.com](mailto:nagobashivraj@gmail.com)

**Thorat Sanket G.**

Department of Pharmaceutical chemistry, Latur College of Pharmacy, Hasegaon, Latur, Maharashtra, India

**Shaikh Ismail Y.**

Department of Pharmaceutical chemistry, Latur College of Pharmacy, Hasegaon, Latur, Maharashtra, India

**Swami Avinash B.**

Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India

**Abstract**--The carbon nanotubes represent an innovative platform for controlled and targeted drug release in several biomedical applications. Carbon nanotube is one of the most efficient dispersed nano-systems with narrow size distribution ranges from 10-240 nm. Carbon nanotubes possess the remarkable electrical, thermal, mechanical conductivity which enables carbon nanotubes to be functionalized to enhance the solubility as well as biocompatibility of poorly bioavailable drugs. Further it can be converted to normal conventional system which is easy to use such as gel. The purpose of this study is to develop a stable nanotube based gel for topical application of fluconazole (BCS Class-II), having low solubility and high permeability to improve its solubility and hence cutaneous deposition to give local effect. The functionalization of pristine nanotubes was done using PEG-400 initially. Six batches (F1-F6) of drug loaded functionalized nanotubes was prepared using ethanol and water (2:1) which was tested for % drug loading and high drug loaded

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**Name of Author:** Ms. V. M. Gaikwad

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### Formulation and Evaluation of Fast Dissolving Oral Film of Promethazine Theoclate

Dhenge Ashwini B, Gaikwad Varsha M<sup>\*</sup>, Nagoba Shivappa N, Giram Padmaja S, Shaikh Nasheer S, Ambad Shruti S, Kamble Sumedh P, Dhenge Abhijeet B and Swami Avinash B

Department of Pharmaceutics, Channabasweshwar Pharmacy College (Degree), Latur, Maharashtra, India

#### ABSTRACT

Aim of the present study was to develop and evaluate fast dissolving oral film containing Promethazine Theoclate. Fast dissolving oral films deliver drug directly in the vascular system via salivary secretion and bypasses the hepatic first pass metabolism, dose of the drug also reduces significantly. Fast dissolving films were prepared using solvent casting method, hydrophilic polymers were selected as film forming agents such as HPMC-K15, HPMC-E15 and PEG-400 was used as plasticizer to give flexibility to the films. In FTIR study no interaction was observed between drug and the excipients. After preparation of film, the drug loaded films evaluated for weight variation, thickness, pH, disintegration time, dissolution time & in-vitro drug release studies. Among the formulations [F1 - F8], formulations F2 and F5 formulations was selected the best formulation as its maximum drug content, disintegration drug release releases was superior than other formulations. Among F2 and F5 formulations, formulation F2 was found to be best formulation compared to F5 formulations. Drug loaded films with both the polymers were stable under 40°C/75% RH conditions.

Keywords: fast dissolving oral film, Promethazine theoclate, Solvent casting method, motion sickness, BCS class

#### INTRODUCTION

Oral drug delivery is one of the most preferred and accepted route of drug delivery, due to easy administration, patient compliance and cost effectiveness. Fast dissolving oral film is one of the recent formulations given through oral route. The oral film is a dosage form that employs a water dissolving polymer which allows the dosage form to quickly hydrate by the saliva, adhere to mucosa, and disintegrates within a few seconds, dissolves and releases medication when placed on tongue or oral cavity. Oral film is used for local action in mouth such as toothaches, oral ulcer, sore throat, cold or local anaesthetic etc. Many drugs like cough remedies, antiasthmatics, antihistaminic, erectile dysfunction drugs, motion sickness drugs, gastrointestinal disorders, nausea, pain and CNS drugs can be incorporated in oral film. Paediatric and geriatric patients have difficulty to take tablet orally because of fear of choking, difficulty in swallowing tablets. To overcome the issues related to tablets, a new drug delivery system for the oral delivery of the drugs, was investigated which is known as Fast dissolving films.

Promethazine theoclate is BCS Class II, H1 antihistaminic drug mainly used in the treatment of motion sickness and postoperative emesis. It has 25% bioavailability due to its poor aqueous solubility which is the major limiting factor for its absorption and delayed onset of action. Various formulations of Promethazine theoclate are available in the market for oral administration. The development of fast dissolving oral films containing **Promethazine Theoclate** offers an alternative to conventional tablets, syrups and injections for the treatment of emetics.

#### MATERIALS AND METHOD

**Promethazine theoclate** was obtained from MBH raw Pharma, mulund, Mumbai. HPMC E15, HPMC K-15 were received from Loba Chemie lab Vikas pharma Goregaon, PEG400, citric acid, aspartame, strawberry flavor and Tween-80 used were of analytical grade.

#### PREFORMULATION STUDY:

**Organoleptic properties:** Promethazine theoclate sample which is supplied from MBH raw pharma Pvt. Ltd. Mulund, Mumbai was closely observed for physical appearance.

**Solubility study:** For the purpose of solubility, additional amount of drug is added in the solvent (methanol, Phosphate buffer, distilled water, ether) at room temperature and kept for 24 hrs with rare shaking. The supernatant was taken and evaluated by using shimadzu UV1800 double beam spectrophotometer.

**Fourier transforms Infra-red Spectroscopy (FTIR) study:** Compatibility of drug with excipients was determined by FTIR study. Combination of drug and excipients was taken in 1:1 ratio and observed for any interaction.



*(Signature)*



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**Channabasweshwar Pharmacy College (Degree)**

Kava Road, Basweshwar Chowk, Latur-413512 (Maharashtra)

Phone No. (02382) 240192, Fax-(02382) 243855

Email- channabasweshwar@gmail.com Website- www.cdphl.org

Approved by:- Govt. Of Maharashtra, AICTE &amp; PCI New Delhi, Affiliated to :- S.R.T.M.University Nanded.

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Title of the Paper: Formulation and Evaluation of Liposomes Containing Erlotinib Hydrochloride

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Name of the Journal: Bulletin of Environment, Pharmacology and Life Sciences

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**ORIGINAL ARTICLE****OPEN ACCESS****Formulation and Evaluation of Liposomes Containing Erlotinib Hydrochloride**Zingade Sarika G<sup>1</sup>, Nagoba Shivappa N.<sup>1\*</sup>, Swami Avinash B.<sup>1</sup>, Vijayendra Swamy S. M.<sup>1</sup><sup>1</sup>Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

Email: nagobashivraj@gmail.com, nshivraj11@rediffmail.com

\*Corresponding Author

**ABSTRACT**

The aim of the present study is to formulate and evaluate liposomes containing Erlotinib hydrochloride. Erlotinib is a tyrosine kinase inhibitor which specifically inhibits epidermal growth factor receptors involved in angiogenesis of human non small cell lung carcinoma and inhibit growth of lung tumor. The present study conducted with the aim of preparing a site targeted nano-sized liposome to enhance the efficacy of Erlotinib which belongs to BCS class II. Total nine formulations were prepared by modified thin film hydration technique in which rotating flask contains glass beads for vortexing; lecithin (encapsulator), cholesterol (rigidator), and organic solvent. These formulations of liposome were evaluated and characterized for physical appearance, pH, drug content, % drug entrapment efficiency, microscopic determination and in vitro drug release. The results inferred PB batch is most promising among all with highest drug entrapment i.e. 84.81% with drug release (~90%). Stability studies were conducted on optimized batch at 4°C, 40°C and room temperature for up to three months and formulation was found as stable at refrigerated temperature 4°C.

**Keywords:** Liposome; Erlotinib; BCS class; Stability.

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**INTRODUCTION**

In 1960, Bangham introduced the liposome drug delivery; that phospholipids combined with water immediately formed a sphere and is capable of carry drug to the site of action [1]. Liposomes are concentric spherical vesicles of phospholipid bilayers having size 20- 1000 nm that are formed spontaneously in aqueous solution. The word liposome made of two Greek words, lipos (fat) and soma (body or structure). Lipid bilayered membrane encloses a central aqueous core of hydrophilic drugs while lipophilic drugs are entrapped within the bilayered membrane [2, 3].

Liposome bi-membrane is composed of natural and synthetic lipids, which are relatively biocompatible, biodegradable and non-immunogenic material. Because of amphipathic bilayer structure properties, liposomes are used as carriers for both lipophilic and water-soluble molecules. Liposomes have good biological properties of biocompatibility and biodegradability. They show promise as active vectors due to their capacity to enhance the entrapment performance by increasing drug solubility, and stability; delivering encapsulated drugs to specific target sites, and providing sustained drug release [4-6].

The liposomes help the drug to penetrate the cancer cells more selectively and decrease the possible side effects (nausea, hair loss and vomiting). Erlotinib is an EGFR-specific tyrosine kinase inhibitor which blocks the catalytic activity of the kinase responsible for non small cell lung cancer, thereby stopping complex network of downstream signaling pathway i.e. responsible for angiogenesis [7]. However, poor aqueous solubility and undesirable side effects limit the clinical application and local treatment of erlotinib. These side effects might be overcome by use of liposomes for tumor delivery and controlled release of erlotinib.

**MATERIAL AND METHODS****Materials:**

Erlotinib tosylate were obtained as a gift sample from Naprod life sciences Pvt. Ltd., Mumbai, India. Soyalecithin and HSPC gifted by Lipoid GmbH, Germany. Cholesterol were purchased from Research Lab Fine Chem Industries, Mumbai. The other chemicals, reagents and solvents used like potassium chloride,

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**Title of the Paper:** In silico analysis of green tea catechins for design of adenosine A<sub>2A</sub> antagonist and nav 1.7 inhibitors

**Name of Author:** Dr. O. G. Bhusnure

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Research article

**In silico analysis of green tea catechins for design of adenosine A<sub>2A</sub> antagonist and nav 1.7 inhibitors****Bhusnure Omprakash G<sup>1\*</sup>****Jadhav Harshada P<sup>1</sup>, Bansode Prashant S<sup>1</sup>, Gaikwad Varsha M<sup>2</sup>, Gholve Sachin B<sup>1</sup>, Giram Padmaja S<sup>2</sup>**<sup>1</sup> Department of Pharmaceutical Quality Assurance, Channabasweshwar Pharmacy College, Latur, Maharashtra., India<sup>2</sup> Department of Pharmacology, Channabasweshwar Pharmacy College, Latur, Maharashtra., India<sup>3</sup> Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra., India**ABSTRACT**

Neuropathic pain is a sensory nerve system disorder that affects a large percentage of the world's elderly population. A sensory nerve system injury causes it, which can lead to function loss, acute discomfort, and heightened pain sensitivity. The PNS is in responsible of the start and maintenance of Neuropathic Pain, despite the fact that the CNS is the major controller of pain. Diseases like diabetes and cancer are connected to a change in lifestyle in today's globe. Concentrating compounds that can boost neurotransmitter release can be used to treat these disorders. Adenosine receptors and sodium channels are the next targets for inflammatory and peripheral neurological diseases. Green tea contains antioxidants such as catechins, EC, EGC, ECG, EGCG, GC, CG, GCG, GCG3ME, ECG3Me, EGCG3Me, and EGCG4Me. This research describes how molecular docking and virtual screening were used to assess the binding potential of green tea catechins for human adenosine A<sub>2A</sub> receptors and sodium channel Nav 1.7 inhibitors. As a result, a number of Green Tea Catechins exhibit exceptional binding abilities.

**Keywords:** Green Tea Catechins, Adenosine A<sub>2A</sub>, Nav 1.7, Molecular Docking, Virtual Screening

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**Correspondence:** Omprakash G Bhusnure ✉ omprakashbhusnure@gmail.com, **Orcid Id:** 0000-0001-7794-5123

Department of Pharmaceutical Quality Assurance, Channabasweshwar Pharmacy College Latur, Maharashtra, India

**INTRODUCTION**

Pain is an apprehensive sensation caused by an acute and injurious trigger that can be either acute or chronic depending on the length of time. Neuropathic pain is typically chronic, lasting for months or years and characterized by recurrent painful episodes [1-2]. Pain induced by a lesion or disease affecting the somatosensory system is described as "pain caused by a lesion or disease affecting the somatosensory system" [3] and can result in both loss of function and disability. Neuropathic pain affects roughly 7-10% of the general population, according to [4]. Neuropathic pain differs from nociceptive pain, which is described as "pain that results from actual or threatened harm to non-neural tissue and is caused by nociceptor activation" [5].

The somatosensory nerve system is functionally normal in nociceptive pain, with aberrant function underlying neuropathic pain. It is prevalent in cancer patients, and it occurs as a result of direct damage to the neurological system caused by a primary tumour or metastases, or as a result of cancer treatment, such as chemotherapy [6]. According to 20% of cancer pain is solely neuropathic in origin. Neuropathic pain was linked to more oncological treatment, higher analgesic requirements (opioids and

powerful opioids and adjuvant analgesics), and lower performance status than nociceptive pain, according to a 2012 study [7]. Patients with neuropathic pain also reported poor physical, cognitive, and social functioning.

Adenosine is the primary neuromodulator in the brain, acting as a supporter for neurotransmitters. Adenosine receptors are a G-protein coupled receptor family that includes four members: A<sub>1</sub>, A<sub>2A</sub>, and A<sub>3</sub> receptors. They are found in practically every human body tissue and organ. In terms of the molecular pathways and second messengers involved, the A<sub>1</sub> and A<sub>3</sub> receptors inhibit adenylyl cyclase (AC) through the G-protein, whereas the A<sub>2A</sub> and A<sub>2B</sub> receptors stimulate it through the G<sub>s</sub> protein. Adenosine also plays a role in the inflammation process by causing the production of TNF- $\alpha$ , macrophage inflammatory protein (MIP)-1 $\alpha$ , MIP-1 $\beta$ , MIP-2 $\alpha$ , and M. Adenosine and adenosine receptor agonists exhibit antinociceptive effects in animal models of acute [8], inflammatory [9] Dopamine and adenosine. In excitable cells, such as nerve, muscle, and neuroendocrine cells, voltage-gated sodium channels are responsible for action potential initiation and propagation [10,11]. Because of their role in neuropathic pain, sodium

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**Title of the Paper:** In-silico exploration of piperine for invent proton pump and protein phosphatase non-receptor Inhibitors in gastric and peptic ulcer

**Name of Author:** Dr. O. G. Bhusnure

**Name of the Journal:** Journal of Medical Pharmaceutical and Allied Sciences

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Research article

**In-silico exploration of piperine for invent proton pump and protein phosphatase non-receptor Inhibitors in gastric and peptic ulcer****Bhusnure Omprakash G<sup>1</sup>, Ware Shrinivas V<sup>1</sup>, Jadhav Harshada P<sup>1</sup>, Bansode Prashant S<sup>1</sup>, Gholwe Sachin B<sup>1</sup>, Giram Padmaja S<sup>2</sup>**<sup>1</sup> Department of Pharmaceutical Quality Assurance, Channabasweshwar Pharmacy College, Latur, Maharashtra, India<sup>2</sup> Department of Pharmacology, Channabasweshwar Pharmacy College, Latur, Maharashtra, India**ABSTRACT**

Anti-ulcer medicines that inhibit the H/K-ATPase enzyme by covalently binding to a cysteine residue of proton pump inhibitors. Through the aforementioned processes, tyrosine-protein phosphatase non-receptor type 11 (PTPN11) causes aberrant mitogenic signals and elongated morphological alterations, as well as the growth and progression of peptic ulcer and gastric cancer. Piperine is an antioxidant derived from the Piper Longum herb. Molecular docking studies and virtual screening were used to investigate it as an H/K-ATPase and PTPN11 inhibitor. The Molecular Docking examination was conducted using the Pyrx 0.8 version free database, while virtual screening was conducted using Biovia Discovery Studio software. H/K-ATPase and PTPN11 have substantial binding affinity of 7.5 and 8.6 kcal/mol, respectively, according to molecular docking investigations. Piperine's anti-ulcer efficacy appears to be aided by H/K-ATPase and PTPN11 binding.

**Keywords:** Proton Pump inhibitors, H/K-ATPase, PTPN11, Molecular Docking, Virtual Screening, Ulcer, Piperine

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**Correspondence:** Omprakash G Bhusnure ✉ omprakashbhusnure@gmail.com, **Orcid Id:** 0000-0001-7794-5123

Department of Pharmaceutical Quality Assurance, Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

**INTRODUCTION**

An ulcer is a surface or region in the digestive tract where tissue has been destroyed or damaged by gastric juice or other digestive enzymes produced by the stomach [1,2]. Peptic ulcer disease, which arises in the stomach or small intestine and is caused by the released gastric acid by the stomach compartment, is the most prevalent primary kind of ulcer that primarily affects the global population [3]. Peptic ulcer illness is defined as a defect in the protective covering of the gastrointestinal tissue, with detectable deep or submucosa involvement [4]. Pain is frequently relieved at night when the pH of gastric juice in the stomach has raised (due to circadian variations), and the pain is localized to an empty stomach for 2 to 5 hours [5].

The gastric proton/potassium pump (H/K-ATPase) is a phosphoenzyme found in the parietal cells that is responsible for excessive gastric acid secretion into the stomach lumen, resulting in acid-related diseases [6]. As a result of its uniqueness to the parietal cells, this enzyme is seen as a good validated hit for anti-ulcer agents [6]. Because proton pump inhibitors impede the enzyme's action, they reduce amount of acid released by the stomach.

Chronic infections are caused by Helicobacter pylori and

positive strains, which can progress to illnesses like peptic ulcers and stomach cancer [7]. Peptic ulcers are a common occurrence of lesioning in the stomach's corpus to antrum mucosae zone. The antral mucosa is colonized by H. pylori, which causes chronic inflammation [8].

H. pylori injects the virulence factor CagA into the gastric epithelial layer via type IV secretion [9], and after tyrosine phosphorylation by the Src family protein tyrosine kinase [10,11], allosterically stimulates the phosphate activity of SHP2, also known as Tyrosine-protein phosphatase non-receptor type 11 (PTPN11) [12]. This causes aberrant mitogenic signals to be produced, as well as elongated morphological alterations. The host cell apoptosis is caused by the continuation of the subsequent processes [13]. Furthermore, epidemiological research has shown that cagA-positive H. pylori has a role in the cause, progression, and growth of peptic ulcer and gastric cancer via mentioned pathways [7,13,14].

Piper Longum Linn., sometimes known as 'Long pepper,' is one of the most important and oldest spices in the world. It belongs to the Piperaceae family. This plant comes from India and thrives in hot, humid regions. Some of the activities of the fruits include CNS



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Title of the Paper: Formulation and Evaluation of Natural Polysaccharide containing Diclofenac sodium

Name of Author: Dr. S. N. Nagoba

Name of the Journal: NeuroQuantology

NeuroQuantology | October 2022 | Volume 20 | Issue 18 | Page 1041-1047 | Doi: 10.48047/NQ.2022.20.18.NQ88098  
Supriya C. Joshi et al / Formulation and Evaluation of Natural Polysaccharide Containing Diclofenac Sodium



## Formulation And Evaluation of Natural Polysaccharide Containing Diclofenac Sodium

Supriya C. Joshi<sup>1</sup>, B. N. Poul<sup>2</sup>, Shivappa N. Nagoba<sup>3\*</sup>

### Abstract

Presently, polysaccharides have to play an important role in pharmaceutical field, among them in the domain of oral dosage forms. The aim of the study was to use naturally available wheat starch polymer in drug delivery system for investigation of the drug release profile of BCS class II Diclofenac sodium. Diclofenac sodium sustained release tablets were prepared by wet granulation method & evaluated for its physicochemical evaluation such as FTIR, UV, friability, hardness, weight variation, drug content, in-vitro dissolution & stability studies. Compatibility study conducted shows that there is no any interaction among the polymer and drugs. Hardness of the tablets was found to be in the range of 10-11 kg/cm<sup>2</sup>. The tablets showed 96-99% of the labeled amount of drug, indicating uniformity in drug content. Diclofenac sodium sustained release tablets batches releases drug up to 8 hrs. Batch DW5 shows 96.74% drug release, as the concentration of wheat starch polymer increases there is SR of drug. In vitro dissolution carried out by as per USP, with pH 6.8 phosphate buffer solutions at 37±0.5 °C and accelerated stability studies conducted on optimized DW5 batch shows that the formulation was stable during stability period and there were no significant change in their drug content and release. Results obtained conclude that natural wheat starch polymer can provide sustained drug release.

**Key Words:** Diclofenac sodium, wheat starch, in- vitro dissolution and stability studies

1041

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### Introduction

Polymers are the backbone of the framework for providing delivery systems. The polymer should be stable, non-toxic, economical, and provide a sustainable release of the drug. At present use of natural materials such as gums, mucillages, resins, and plant waste etc are gaining interest in field of science. However use of natural polymers have played important role in pharmaceutical science. Natural polymers may be used as the basis to achieve predetermined drug distribution throughout the body.

Delivery of drugs (BCS II & IV) and biomolecules is difficult due to poor bioavailability following administration. Thus, use of natural polymeric carrier systems is being investigated to improve drug solubility, stability, and induced toxicity. Further use of polymer can sustain drug release as necessary. The sustained release dosage forms have

the advantages of the less drug fluctuation in blood, reduced frequency in dosing, improved patient convenience and compliance, reduction in adverse side effects and reduction in cost. This research has made use of wheat starch in different proportion for sustained release formulation. BCS class II Diclofenac sodium selected for study as to know the effect of solubility on the polymeric release of class II drug. Thus, the main objective of this research is to investigate application of natural polymer to the drug delivery system for Diclofenac.

### Materials and methods

#### A. Materials

Diclofenac sodium, Wheat starch, Avicel 101, Polyvinyl Pyrrolidone K-30 (PVP K30), Isopropyl alcohol, Acetone, Talc and Magnesium stearate are of analytical grade quality obtained from Research-Lab Fine Chem Industries, Mumbai 400 002. (India).

**Corresponding author:** Shivappa N. Nagoba

**Address:** 1<sup>st</sup>Channabasweshwar Pharmacy College (Degree), Latur, 2<sup>nd</sup>Maharashtra Polytechnic (D. Pharmacy) Institute, Nilanga,

Latur

E-mail: nagobashivra@gmail.com, nshivra11@rediffmail.com

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**ORIGINAL ARTICLE**

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## Formulation and Evaluation of Niosomal Topical Gel Containing Monoammonium Glycyrrhizinate

Patil Pooja Y.<sup>1</sup>, Nagoba Shivappa N. <sup>1\*</sup>, Agwane Shanta G<sup>1</sup>, Salunke Swati G.<sup>2</sup>

<sup>1</sup>Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

<sup>2</sup>Mauli College Pharmacy (Degree), Tondar, Udgr.

Email: nagobashivraj@gmail.com, nshivraj11@rediffmail.com

\*Corresponding Author

### ABSTRACT

The aim of present study to formulation and evaluation of niosomal topical gel containing Monoammonium Glycyrrhizinate. However the product has a drawback of poor bioavailability due to high molecular weight, less residence time. These problem can be reduced by the niosomal topical gel formulation. Niosomal formulation were prepared using various surfactants (span20, span40, span60, span80) in the presence of cholesterol in different ratios (1:1, 1:2) by thin film hydration technique. They were evaluated for Appearance, pH, entrapment efficiency and in vitro drug release. Optimized formulation of niosomal suspension F6 using cholesterol and span 60 in the ratio 1:2 shows higher entrapment efficiency of the vesicles and invitro sustained drug release showed high retention of [Q12h= 70.50] the vesicles. The optimized formulation was formulated as topical gel using carbopol and HPMC K1M in different ratios and evaluated for gelling capacity, pH, viscosity, invitro drug release, drug content, isotonicity study, stability study. Optimized formulation of niosomal topical gel (G3) showed higher drug content 93.80% & showed maximum sustained release 70.50 % for a period of 12 hrs. It was concluded that niosomal topical gel is viable alternative for conventional gel and provide localized drug delivery and ability to sustain drug release.

**Keywords:** Niosome, Monoammonium Glycyrrhizinate, topical drug delivery.

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### INTRODUCTION

Glycyrrhizaglabra L. is a perennial shrub belonging to the family of Leguminosae. It contains triterpene saponins (3–5%), mainly glycyrrhizic acid (a derivative of glycyrrhetic acid), and flavonoids (1–1.5%). Triterpene saponins have an anti-inflammatory activity due to the strengthening of the glucocorticoid activity [1-5]. Recent studies demonstrate that licorice extracts are useful in the treatment of dermatitis, eczema, and psoriasis, with an efficacy comparable to that of corticosteroids. The characterization of the ammonium salt of glycyrrhizic acid is anti-inflammatory activity. The topical application of this compound as an anti-inflammatory agent can be improved by using various drug delivery systems, e.g., niosomes, which can enhance the permeation through the skin stratum corneum and hence promote the dermal pharmacological action [6-8].

Niosomes are non-ionic surfactant vesicles capable of entrapping hydrophilic and hydrophobic molecules. Niosomes are unilamellar or multilamellar vesicles formed from synthetic, non-ionic surfactant of alkyl or di-alkyl polyglycerol ether class. Niosomes can entrap solutes like liposomes, it is more stable in vitro, and it can improve the stability and duration of action of an entrapped drug as compared to the conventional dosage forms. Niosomes have been several advantages such as higher chemical stability, contact time, and skin penetration enhancing properties. Better targeting of drugs to the infected organ scan be achieved by niosomal formulation due to the presence of non-ionic surfactants with lipids. The presence of non-ionic surfactants increases the permeability of Monoammoniumglycyrrhizinate through the biological membrane and also reduces the systemic toxicity of anti-infective drugs. Drug deposition and entrapment efficiency were the key parameters involved in the formulation of topical Niosomal gel. The number of formulation and processing variables are involved during niosome preparation may affect these parameters and hence the performance of the formulation [9-13].



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Title of the Paper: In-Vitro Estimation of Antioxidant and Antidiabetic Potential of Plant Extract

Name of Author: Dr. S. M. Vijayendra Swamy

Name of the Journal: NeuroQuantology

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DIPALI P. SHELKE et al/ IN-VITROESTIMATION OF ANTIOXIDANT AND ANTIDIABETIC POTENTIAL OF PLANT EXTRACTS

## IN-VITROESTIMATION OF ANTIOXIDANT AND ANTIDIABETIC POTENTIAL OF PLANT EXTRACTS

DIPALI P. SHELKE<sup>\*1</sup>, VIJAYENDRA SWAMY M<sup>2</sup>

<sup>1</sup>Department of Pharmacology, Channabasweshwar Pharmacy College, Latur-413512

<sup>2</sup>Professor and Principal, Channabasweshwar Pharmacy College, Latur-413512

Corresponding Author:

Dipali p. Shelke

Email- deep.shelke11@gmail.com

### Abstract

Medicinal plants have always been the principal sources of medicine worldwide. India sustains a very rich traditional medicinal plant wealth and inherits unique plant and animal communities. Free radicals are implicated in many diseases like diabetes, inflammation, cancer, which leads to gained more attraction of antioxidant therapy. Diabetes is a metabolic disorder which results due to deficiency in insulin and its metabolism. At present, the prevalence of Diabetes has increased worldwide and predicted to increase to greater extent in future generations. Among various therapeutic approaches implemented to prevent diabetes is to regulate the blood glucose levels by various mechanisms. Present study enumerates the *In-Vitro* Evaluation of Antioxidant and Antidiabetic Potential of Plant Extracts. Phytochemical screening showed the presence of alkaloids, glycosides, carbohydrates, steroids and flavonoids in both the extracts. Physical parameters like solubility, MP, ash values, LOD, extractive value etc. has been studied. The antioxidant activity of the extract was done by using DPPH and H<sub>2</sub>O<sub>2</sub> method. This is being assessed by assay such as inhibition of  $\alpha$ -amylase enzyme suppresses the level of production of glucose. Our results suggested that *D. strictus* extracts showed potential *In-Vitro* antioxidant and anti-diabetic activity which indicates that this extract can be taken further for pharmacological study.

KEYWORDS: *D.strictus*, Physicochemical parameter, Antioxidant effect, Anti-diabetic activity,  $\alpha$  amylase enzyme.

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NeuroQuantology 2022; 20(22):1645-1652

### INTRODUCTION:

Hyperglycemia (high blood sugar) is a symptom of diabetes mellitus (DM), a long-term condition of carbohydrate, lipid, and protein metabolism caused by problems with insulin levels, insulin action, or both. Currently, it is one of the worst global health issues that can cause both microvascular and macrovascular consequences. By 2040, there will probably be 700 million persons  
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with diabetes worldwide. Reactive oxygen species (ROS), which are known to be produced by hyperglycemia, are crucial in the development of diabetic complications. Antioxidants are substances or nutrients found in food that function as free radical scavengers, preventing and repairing damage from reactive oxygen and nitrogen species (ROS) and reactive nitrogen species (RNS). As a result, antioxidants can strengthen the immune  
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DTE Code :- 2253, University Code :- 947

**Title of the Paper:** Validation of Reversed - Phase HPLC method for the Estimation of Cefixime Trihydrate and Linezolid in Tablet dosage form

**Name of Author:** Ms. R. B. Wale

**Name of the Journal:** International journal of analytical and experimental modal analysis

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### Validation of Reversed - Phase HPLC method for the Estimation of Cefixime Trihydrate and Linezolid in Tablet dosage form

Risha R. Wale<sup>\*1</sup>, Tushar Pandharkar<sup>2</sup>, Tukaram M. Kalyankar<sup>2</sup>, M. S. Attar<sup>1</sup> and Anitha K.<sup>3</sup>

<sup>1</sup>Channabasweshwar Pharmacy College (Degree), Latur

<sup>2</sup>Department of Pharmaceutical Chemistry, School of Pharmacy, S. R. T. M. University, Vishnupuri, Nanded, Maharashtra, India

<sup>3</sup>Department of Chemistry, Sri Krishnadevaraya University, Ananthapuramu-515003, Andhra Pradesh, India

\*Corresponding Author

Ms. R. R. Wale

E-mail address: [rishawale15@gmail.com](mailto:rishawale15@gmail.com)

Tel.: +91 7020344599

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**Name of Author:** Dr. S. N. Nagoba

**Name of the Journal:** European Chemical Bulletin

DESIGN DEVELOPMENT AND EVALUATION OF MEDICATED LOZENGES CONTAINING LAMOTRIGINE

Section A -Research paper



**DESIGN DEVELOPMENT AND EVALUATION OF  
MEDICATED LOZENGES CONTAINING LAMOTRIGINE**

**Kombade Rohit R<sup>1\*</sup>, Nagoba Shivappa N<sup>1</sup>, Kazi Wasim B<sup>1</sup>, Swami  
Avinash B<sup>1</sup>, Bansode Prashant S.<sup>1</sup>**

<sup>1</sup>Department of Pharmaceutics, Channabasweshwar Pharmacy College (Degree),  
Latur-413512, Maharashtra, India.

**ABSTRACT**

Lozenges are sweetened base medicated, flavored unit solid dosage form intended to be sucked or held in the mouth which. These are medicated confections designed for local as well as systemic therapy. Lamotrigine is an anticonvulsant drug used in the treatment of epilepsy and neuropathic pain. In the current investigation, Six different formulations of Lamotrigine lozenges were prepared successfully on a laboratory scale by heating and congealing technique. Lozenges dosage form improve bioavailability and increase patient compliance, especially for those patients who have difficulty in Swallowing. different ingredients i.e sucrose, dextrose, citric acid, coloring agent, and menthol were incorporated with polymer HPMC K100 and HPMC E5 in different ratios. In the lamotrigine lozenges formulatio. All the formulations prepared Lamotrigine hard lozenges evaluated for physicochemical parameters like hardness, friability, content uniformity, weight variation, thickness and drug content and in vitro dissolution studies. Stability studies of selected formulations of batch F5 have also been carried out at 40°C and 75% relative humidity for Three months. There wasn't any substantial interaction between the drug, polymer, flavor and colour and the prepared formulations were found to be stable.

**Keywords:** Lamotrigine, Epilepsy, in vitro dissolution, Lozenges, Stability study.

**DOI:** 10.31838/ecb/2022.11.12.62

**INTRODUCTION**

Lozenges are solid sugar-based medicated unit dosage forms incorporated with another medicament for local and systemic effect therapy. Oral drug delivery is the most favorable convenient route for dose administration. It Can be given to those patients who have difficulty swallowing. Easy to administer to the geriatric and pediatric populations<sup>1</sup>. It has a pleasant taste. It extends the time of the drug in the oral cavity to elicit a specific effect. Easy to prepare, with a minimum amount of equipment and time. Lozenges dosage form improve bioavailability by bypassing first pass metabolism hence dosing frequency also reduced and also reduce gastric irritation. It can improve the onset of action.<sup>2</sup>



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**Name of Author:** Ms. V. K. Khadkutkar

**Name of the Journal:** Journal of University of Shanghai for Science and Technology

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### Nanocrystallisation by Anti-Solvent Precipitation Technique for Solubility and Dissolution Enhancement of Telmisartan

V. K. Khadkutkar<sup>1\*</sup>, M S Attar<sup>1</sup>, Dr. S.S. Dudhamal<sup>2</sup>

1 Assistant Professor, Channabasweshwar Pharmacy College (Degree), Latur.

2. Sr. Lecturer, Maharashtra Pharmacy Diploma Institute, Nilanga.

**\*Corresponding Author**

Ms. V. K. Khadkutkar

Email id : [khadkutkarvk@gmail.com](mailto:khadkutkarvk@gmail.com)



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Title of the Paper: Osteoarthritis: Management

Name of Author: Dr. S. M. Vijayendra Swamy

Name of the Journal: International Journal of Advance and Innovative Research

**OSTEOARTHRITIS: MANAGEMENT**Sayyed Simakousar N<sup>1</sup>, Dr. Vijayendra Swamy S. M<sup>2</sup>, Dr. Giram Padmaja<sup>3</sup>, Dr. Nagoba Shivappa<sup>4</sup>,  
Ashika Mattha<sup>5</sup> and Waghmare Kanchan<sup>6</sup><sup>1, 2, 4, 6</sup>Department of Pharmaceutics, Channabasweshwar Pharmacy College (Degree), Latur<sup>3</sup>Department of Pharmacology, Channabasweshwar Pharmacy College (Degree), Latur<sup>5</sup>Spartan University, School of Medicine, Saint Lucia**ABSTRACT**

Osteoarthritis is one of the most common musculoskeletal diseases today. It is one of the leading causes of dysfunction that affects quality of life. Osteoarthritis is a very common disease affecting joint cartilage. Pain relief, improved joint function, and joint stability are the main goals of treatment. Weakness and muscle atrophy contribute to the progression of the disease. The diagnosis is based on a history of joint pain worsened by movement, which may result in disability in activities of daily living. Plain radiography, magnetic resonance imaging, ultrasound, laboratory testing may help in diagnosis. This article presents an overview of the current knowledge on osteoarthritis sign and symptoms, diagnosis, treatment strategies are discussed.

**Keywords:** Osteoarthritis, Musculoskeletal, Plain radiography, Treatment

**INTRODUCTION**

Osteoarthritis is a common chronic, inflammatory joint disease that most often affects middle age to elderly people. It is commonly referred as "wear and tear" of joints; OA is now recognized as a disease that affects the entire joint, including the cartilage, joint lining, ligaments, and bone. Although it is more common in elderly person, it is not really accurate to say that the joints are just "wearing out". It is characterized by the breakdown of cartilage, bony alterations in the joints, tendons and ligaments deterioration and varying degrees of inflammation of the joint lining (called the synovium). Osteoarthritis most commonly affects the hands, lower back, neck, and weight-bearing joints such as knees, hips, and feet. Osteoarthritis affects just joints, not internal organs. Treatment for osteoarthritis aims to relieve pain and enhance function. There is no cure for the osteoarthritis, but some treatments may slow disease progression<sup>[1]</sup>.

**SIGNS AND SYMPTOMS****1. Pain**

The most prevalent symptom is chronic pain, the concentration of Excitatory Amino Acids (EAA), particularly glutamate; rises during the development of knee joint inflammation which is released from the sensory neurons in the spinal cord contribute to hyperalgesia and pain in the afflicted location. The pain tends to worsen with activity, especially following a period of rest; this has been called the gelling phenomenon<sup>[2]</sup>.

**2. Joint Stiffness**

Osteoarthritis usually presents as morning stiffness, but it usually lasts for less than 30 minutes. Patients may also complain of asymmetric joint locking and/or joint instability. The concept of joint stiffness in arthritis and related disease was introduced in the early 1960s. It is shown that Surface Active Phospholipid (SAPL) (synovial surfactant) are capable of reducing friction to very low levels and providing excellent mobility, this lining is deficient in osteoarthritis and lead to stiffness of joint<sup>[3,4]</sup>.

**3. Muscle Weakness**

Quadriceps muscle strengthening is a vital function in knee joint protection. According to cross-sectional studies, strength is related to physical function and that increasing quadriceps strength reduces pain and improves function. A study suggests that thigh muscle strength may protect the knee joint against damage and slow down the progression of osteoarthritis<sup>[5]</sup>. An Atherogenic Muscle Inhibitor (AMI) is a presynaptic, continuous reflex inhibition of muscle activity in the joint that occurs following significant joint damage. It inhibits quadriceps strength and prevents their full activity. Weak quadriceps have been linked to a greater rate of force being applied to the knee joint. AMI is induced by activation in numerous inhibiting pathways, and the severity of the condition varies depending on the amount of joint damage<sup>[6]</sup>.

**4. Bone Enlargement And Swelling**

Pathological alterations in articular cartilage and knee joint caused by a variety of factors result in soft tissue blockage and edema, blood circulation disturbances, chondrocyte erosion and damage, and even increased bone density and cystic abnormalities resulting in swelling and pain<sup>[7]</sup>.

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**Title of the Paper:** Formulation and Evaluation of Oral Gel from Oscimum Sanctum Extract for Treatment of OSMF

**Name of Author:** Dr. O. G. Bhusnure

**Name of the Journal:** International Journal of Pharmaceutical Research and Applications



## Formulation and Evaluation of Oral Gel from Oscimum Sanctum Extract for Treatment of OSMF

Mr. Mayur R. Marewad<sup>1</sup>, Mr. Krishna J. Biradar<sup>2</sup>, Dr. Omprakash G. Bhusnure<sup>1\*</sup>, Padmaja S. Giram<sup>3</sup>

<sup>1</sup>Department of Quality Assurance, <sup>2</sup>Department of Pharmaceutics, <sup>3</sup>Department of Pharmacology, Channabasweshwar Pharmacy College, Kava Road, Latur - 413512, Maharashtra, India.

\*Corresponding author: Prof. Dr. Omprakash G. Bhusnure, M. Pharm, Ph.D. Professor and Head Channabasweshwar Pharmacy College, Department of Quality Assurance, Kava Road, Latur-413512; Dist. Latur. (MS)

Submitted: 01-07-2022

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### ABSTRACT

Oral submucous fibrosis (OSMF) is a high risk precancerous condition characterized by changes in the connective tissue fibers of the lamina propria and deeper parts leading to stiffness of the mucosa and restricted mouth opening. The exact etiology of OSMF is still obscure, though various etiologic factors are being mentioned such as genetic, autoimmune, nutritional and environmental; the areca nut chewing habits has been associated with OSMF. *Oscimum sanctum* L. possesses anti-inflammatory, analgesic, antipyretic, antidiabetic, hepatoprotective, hypolipidemic, antistress, and immunomodulatory activities. Preclinical studies have also shown that Tulsi and some of its phytochemicals eugenol, rosmarinic acid, apigenin, myretanal, luteolin,  $\beta$ -sitosterol, and carnolic acid prevented chemical-induced skin, liver, oral, and lung cancers and to mediate these effects by increasing the antioxidant activity, altering the gene expressions, inducing apoptosis, and inhibiting angiogenesis and metastasis. Gels are typically semi-solid formulations having a liquid phase that has been thickened with other components. Gels are formulated by using polymer, preservatives and pH adjuster. Carbopol, Methyl paraben and Triethanolamine are used as polymer, preservative and PH adjuster in oral gel.

**Keywords:** oral submucous fibrosis, *oscimum sanctum*, antioxidant, Carbopol.

### 1. INTRODUCTION

#### Tongue<sup>[1, 2]</sup>

Tongue is commonly identified as the organ of taste. It also benefits to articulate speech. The secondary functions of the tongue are to help swallowing and chewing the food. Tongue is made up of many muscles. The upper surface contains the taste buds, which act as the primary organ

of taste. The tongue's upper surface is also covered with numerous lingual papillae. Saliva keeps the tongue moist, which is necessary to keep it sensitive, and is abundantly supplied with nerves and blood vessels. The tongue also serves as a natural means of cleaning the teeth. The tongue is the only visible part of the digestive tract and therefore, considered as the mirror that reflects the conditions of the body's internal organs, particularly the organs of digestion and metabolism. The tongue also reflects the overall digestive, nutritive and metabolic condition of the entire organism. It can prove to be a key factor in determining many conditions and the overall health of the body.

Healthy tongue is free of any discomfort such as pain, stinging, burning, swelling or numbness. It is moist, with a rough surface and has an evenly colored pink surface overlying pale red. Through its sense of taste, the tongue signals to the body, particularly to the digestive organs, to secrete the digestive juices that help the digestion. For example, the taste of fried food signals to the liver and gall bladder to release bile in order to digest the fat.

#### Examination of Tongue

It is easy to examine the tongue in a conscious patient, but difficult in unconscious patients, non-co-operative patients and children. In small children tongue may be examined by gently pressing mental protuberance with index finger and gradually opening the mouth, the baby will protrude the tongue automatically, of course, it is a knack that can be gained by experience.

Examination of the tongue coat yields information on imbalances prevailing in the body, particularly in the digestive tract. It also provides information on the overall state of the patient's



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**Title of the Paper:** Formulation and Evaluation of Nanosponge Based Topical Gel Preparation by QBD Approach

**Name of Author:** Dr. O. G. Bhusnure

**Name of the Journal:** International Journal of Scientific Research in Science and Technology



## Formulation and Evaluation of Oral Gel from *Oscimum Sanctum* Extract for Treatment of OSMF

Mr. Mayur R. Marewad<sup>1</sup>, Mr. Krishna J. Biradar<sup>2</sup>, Dr. Omprakash G. Bhusnure<sup>1\*</sup>, Padmaja S. Giram<sup>3</sup>

<sup>1</sup>Department of Quality Assurance, <sup>2</sup>Department of Pharmaceutics, <sup>3</sup>Department of Pharmacology  
Channabasweshwar Pharmacy College, Kava Road, Latur - 413512, Maharashtra, India.

\*Corresponding author: Prof. Dr. Omprakash G. Bhusnure, M. Pharm, Ph.D. Professor and  
Head Channabasweshwar Pharmacy College, Department of Quality Assurance, Kava Road, Latur-413512, Dist.  
Latur, (MS)

Submitted: 01-07-2022

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### ABSTRACT

Oral submucous fibrosis (OSMF) is a high risk precancerous condition characterized by changes in the connective tissue fibers of the lamina propria and deeper parts leading to stiffness of the mucosa and restricted mouth opening. The exact etiology of OSMF is still obscure, though various etiologic factors are being mentioned such as genetic, autoimmune, nutritional and environmental; the areca nut chewing habits has been associated with OSMF. *Oscimum sanctum* L. possesses anti-inflammatory, analgesic, antipyretic, antidiabetic, hepatoprotective, hypolipidemic, antistress, and immunomodulatory activities. Preclinical studies have also shown that Tulsi and some of its phytochemicals eugenol, rosmarinic acid, apigenin, myretanal, luteolin,  $\beta$ -sitosterol, and carnolic acid prevented chemical-induced skin, liver, oral, and lung cancers and to mediate these effects by increasing the antioxidant activity, altering the gene expressions, inducing apoptosis, and inhibiting angiogenesis and metastasis. Gels are typically semi-solid formulations having a liquid phase that has been thickened with other components. Gels are formulated by using polymer, preservatives and pH adjuster. Carbopol, Methyl paraben and Triethanolamine are used as polymer, preservative and PH adjuster in oral gel.

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**Title of the Paper:** Anticonvulant Potential of the Oxazetidine Derivatives

**Name of Author:** Dr. P. S. Giram

**Name of the Journal:** Journal of University of Shanghai for Science and Technology

### Anticonvulant Potentail of the Oxazetidine Derivatives

Lonikar N.B.<sup>1\*</sup>, Giram P.S.<sup>2</sup>, Bavage S.B.<sup>1</sup>, Bhushnure O.G.<sup>2</sup>

1. Latur College of Pharmacy, Hasegaon, Latur (MS), India

2. Channabasweshwar Pharmacy College (Degree), Kava road, Basweshwar Chowk, Latur (MS), India.

\*Corresponding author:

Dr. Lonikar N.B.  
Latur College of Pharmacy, Hasegaon, Latur (MS),  
India  
Email: nitinlonikar@gmail.com

#### ABSTRACT:

Anticonvulsant potential of the 2-[3-chloro-2-(4-chlorophenyl)-4-oxazetidin-1-yl]-3-(1H-indol-3-yl)propanoic acid (NL2(2)), 2-[3-chloro-2-(4-methoxyphenyl)-4-oxazetidin-1-yl]-3-(1H-indol-3-yl)propanoic acid (NL2(3)), 2-[3-chloro-2-(3-nitrophenyl)-4-oxazetidin-1-yl]-3-(1H-indol-3-yl)propanoic acid (NL2(4)) has been reported. The anticonvulsant activity have been carried out via maximal electroshock (MES) induced convulsion and Pentylenetetrazole (PTZ) induced convulsion model. Biochemical analysis for both models have been performed via analysis of Malondialdehyde (MDA), reduced Glutathione (GSH) reagent estimation and measurement of *Catalase* activity and SOD activity. Derivative 2-[3-chloro-2-(4-methoxyphenyl)-4-oxazetidin-1-yl]-3-(1H-indol-3-yl)propanoic acid (NL2(3)) exhibited potent and having comparable bioactivity to the standard in both animal models.

#### KEY WORDS:

Anticonvulsant, Oxazetidine, maximal electroshock (MES) induced convulsion, Pentylenetetrazole (PTZ) induced convulsion







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#### DESIGN AND OPTIMIZATION OF HERBAL GEL CONTAINING ANDROGRAPHIS PANICULATA NEES

Dr. Vijayendra Swamy S. M<sup>1</sup>, Mr. Biradar Krishna J<sup>2\*</sup>, Dr. Nagoba S. N<sup>3</sup> and Mr. Hindole S. S<sup>4</sup>

<sup>1</sup>Principal, Channabasweshwar Pharmacy College, Kava Road, Latur - 413512, Maharashtra, India

<sup>2,3</sup>Department of Pharmaceutics, Channabasweshwar Pharmacy College, Kava Road, Latur - 413512, Maharashtra, India

<sup>4</sup>Department of Pharmacognosy, Channabasweshwar Pharmacy College, Kava Road, Latur - 413512, Maharashtra, India

#### ABSTRACT

In the present research work an attempt was made to design and optimization *Andrographis paniculata* extract herbal gel. *Andrographis paniculata* were standardized and gel of *Andrographis Paniculata* extract were prepared containing polymers like Xanthan gum, HPMC, Carbopol. The Gel was prepared by simple homogenization method. All formulations were checked for PH, Spreadability, Drug content, in-vitro diffusion studies, viscosity, and results were within the limits. The in-vitro diffusion studies were carried out using diffusion cell. Among all the formulations (F1 to F8) prepared, batch F6 was the best formulation released 88.5 %. In the formulation F1-F8 Xanthan gum has been used as natural Gelling agent using as the lower to higher concentration it was increase their Viscosity and Spreadability. It is efficient to formulate *andrographis paniculata* herbal drug extract in the form of herbal gel using different polymer for safety, efficacy and better promote skin bacterial infections, patient compliance as an formulation.

**Key words:** *Andrographis paniculata*; Antibacterial; Herbal gel; Kalmegh; Hepatoprotective.

#### INTRODUCTION:

Skin is one of the most readily accessible organs on human body for topical administration and is main route of topical drug delivery system. Topical delivery can be defined as the application of a drug containing formulation to the skin to directly treat cutaneous disorders (e.g. acne) or the cutaneous manifestations of a general disease (e.g. psoriasis) with the intent of containing the pharmacological or other effect of the drug to the surface of the skin or within the skin. A number pharmaceutical product widely used in topically for preventing topical disease or disorders. Semi-solid formulation in all their diversity dominate the system for topical delivery, but foams, spray, medicated powders, solutions. While the intact skin is much less permeable than other tissues many substances do penetrate the skin to some degree, at relatively slow rates the penetration of the drugs and other substances through skin depends on; the physicochemical properties of the penetrant, the state of the skin and the nature of the vehicle. Drugs applied topically, mainly for local action, include anti-septic, anti-fungal, anti-inflammatory agents as well as skin emollients for protective effects.

Gels are semisolid systems in which a liquid phase is constrained within a three dimensional polymeric matrix (consisting of natural or synthetic gums) in which a high degree of physical (or sometimes chemical) cross-linking has been introduced. The polymers used to prepare pharmaceutical gels include the natural gums tragacanth, pectin, carrageen, agar and alginic acid, synthetic and semisynthetic materials such as methyl cellulose, hydroxyethylcellulose, carboxymethylcellulose and the carbopols which are synthetic vinyl polymers with ionizable carboxyl groups.

*Andrographis paniculata* also called Kalmegh or "King of Bitters" belongs to family Acanthaceae. It has been used for centuries in Asia to treat gastro-intestinal tract and upper respiratory infections, fever, herpes, sore throat, and a variety of other chronic and infectious diseases.

#### MATERIALS AND METHODS:

##### A) Materials:

*Andrographis Paniculata* were obtained as a gift sample from Sun pure extract pvt, Ltd. Other ingredients are Methanol solvent (HiMedica Laboratories pvt. Ltd.), Carbopol 934 (Loba chemie Mumbai), Xanthan Gum (Meher chemical Mumbai), HPMC K4 (Moly chemie Mumbai), Glycerin (Vikash Pharma Mumbai), Rosemary oil (Vishal chemie Mumbai), Methyl paraben or Propyl paraben (Ozone international Mumbai) Triethanolamine or Propylene glycol (Moly chemie Mumbai).

##### B) Methods:

1. Preformulation study;
2. Preliminary phytochemical tests;



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Email- [channabasweshwar@gmail.com](mailto:channabasweshwar@gmail.com) Website- [www.cdphl.org](http://www.cdphl.org)

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DTE Code :- 2253, University Code :- 947

**Title of the Paper-** Design, Synthesis and Biological Investigation of Some Novel Quinazolin-4(3H)-One Tethered 1,3,4-Thiadiazole-Thiol Motifs as Direct Enoyl acyl Carrier Protein Reductase Inhibitors

**Name of Author-** Dr. A. N. Deshpande

**Name of the Journal-** Journal of Pharmaceutical Research International



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### Design, Synthesis and Biological Investigation of Some Novel Quinazolin-4(3H)-One Tethered 1, 3, 4-Thiadiazole-Thiol Motifs as Direct Enoyl Acyl Carrier Protein Reductase Inhibitors

Anant Deshpande<sup>1\*</sup>, Shashikant Dhawale<sup>2</sup>, Sanjaykumar Bari<sup>3</sup>  
and Chandrakant Bonde<sup>4</sup>

<sup>1</sup>Department of Pharmaceutical Chemistry, Government College of Pharmacy, Karad, Maharashtra, India.

<sup>2</sup>Department of Pharmacology, School of Pharmacy, Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra, India.

<sup>3</sup>Department of Pharmaceutical Chemistry, H. R. Patel College of Pharmacy, Shirpur, Maharashtra, India.

<sup>4</sup>School of Pharmacy and Technology Management, SVKM's Narsee Monjee Institute of Management Studies, Shirpur, Maharashtra, India.

#### Authors' contributions

This work was carried out in collaboration among all authors. Author AD designed the study, performed the computational studies and the bench work, synthesized the derivatives, and prepared the first manuscript draft. Author SD guided throughout the research and confirmed the final result analyses. Authors SB and CB managed the literature searches. All authors read and approved the final manuscript.

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#### ABSTRACT

**Aims:** In this study two noteworthy pharmacophores quinazolin-4(3H)-one and 1,3,4-thiadiazole through methylene bridge were utilized to design, synthesize and characterize some novel 2-methyl quinazolin-4(3H)-one and 6-chloro-2-methyl quinazolin-4(3H)-one tethered S-substituted-1,3,4-

\*Corresponding author: E-mail: [anant.deshpande@cdphl.org](mailto:anant.deshpande@cdphl.org)



  
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**Title of the Paper:** Development and Characterization of Terminalia arjuna Phospholipid Complex and Its Tablet Formulation by QBD Approach

**Name of Author:** Dr. O.G. Bhusnure

**Name of the Journal:** International Journal of Life science and Pharma Research

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**International Journal of Life science and Pharma Research**

Research Article

Pharmaceutics for effective drug dosage

**Development and Characterization of Terminalia arjuna Phospholipid Complex and Its Tablet Formulation by Qbd Approach**WaghmareSagar Saudagar<sup>1</sup>, GiramPadamja Sidram<sup>2</sup>, GholveSachin Baburo<sup>1</sup>, GauravAgarwal<sup>3</sup>Shilpi Agarwal<sup>1</sup>, Bhusnure Omprakash Gadgeppa<sup>1\*</sup><sup>1</sup>Department of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Kava Road, BasweshwarChowk, Latur – 413512, Maharashtra, India.<sup>2</sup>Department of Pharmacology, Channabasweshwar Pharmacy College (Degree), Kava Road, BasweshwarChowk, Latur – 413512, Maharashtra, India.<sup>3</sup>Shikhar Institute of Pharmacy, Budour, Uttar Pradesh, India

**Abstract:** Phytosomes are a newly introduced novel drug delivery system and novel botanical formulation to induce lipophilic molecular complexes to enhance absorption and bioavailability of phytoconstituents. Terminalia arjuna phospholipid complex and its tablet formulations targeted for cardiovascular systems was prepared. Our study aims is for improving the cardioprotective activity by formulating Terminalia arjuna phospholipid complex tablet by using solvent evaporation method, and characterized by various parameters like solubility studies, particle size determination, infrared absorption (FTIR), Scanning electron microscopy (SEM), entrapment efficiency etc. as well as by applying Qbd approach various general characteristics such as entrapment efficiency etc were also done. A Qbd- based approach using a Box-Behnken design was done to obtain a response surface design expert software 9.0.5 to systematically study the combined influence of the formulation and process variables such as the phospholipids-drug ratio(X1, w/w), the reaction temperature(X2, °C), and the reaction time (X3, hrs) on a critical quality attributes (CQAs) of the product i.e., the entrapment efficiency. Using this design, the experimental trials were carried out at all 15 possible combinations. The preliminary investigation of the influence of factors revealed that all the tested variables, i.e., the phospholipids to drug ratio, the reaction temperature and the reaction time had a significant influence on the entrapment efficiency of the prepared phytosomes. The study revealed that the entrapment efficiency of Terminalia arjuna Phytosomes was found to be 83.0-97.9 %w/w.

**Keywords:** Qbd approach, Terminalia arjuna extract, Cardioprotective, Terminalia arjunaphytosome complex, Tablet formulation.

**\*Corresponding Author**

Bhusnure Omprakash Gadgeppa , Department of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Kava Road, BasweshwarChowk, Latur – 413512, Maharashtra, India



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Title of the Paper: Evaluation of Antioxidant Power of Polyherbal Formulation

Name of Author: Dr. O.G. Bhusnure

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**JOURNAL OF COMPLEMENTARY  
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## RESEARCH ARTICLE

**EVALUATION OF ANTIOXIDANT POWER OF  
POLYHERBAL FORMULATION**SHIVAKUMAR S. LADDE<sup>1</sup>, BHUSNURE O. G<sup>2\*</sup><sup>1</sup>Research Scholar, Research Center of Channabasweshwar Pharmacy College, Latur- 413512, Maharashtra, India<sup>2</sup>Dept. of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Latur- 413512, Maharashtra, India, Email: shivkumarladde@gmail.com

\*Corresponding Author

**ABSTRACT**

Oxidative stress is a pathological state that is responsible for the growth of chronic disorders like arteriosclerosis, cancer, diabetes mellitus, liver injury, inflammation, skin damages, coronary heart diseases, and arthritis. Antioxidants are substances that when found in food or herbs, that stop and stabilize the oxidative damage triggered by free radicals by providing electrons from antioxidants to these damaged cells. Ayurveda is said to be holistic as its objectives to integrate and balance body, mind, and spirit to stop illness and promote wellness, longevity, vitality, and happiness; hence in the current research we are planning to prepare and assess the efficacy of the total antioxidant potential and radical scavenging activity of a polyherbal formulation. The total antioxidant power and free radical scavenging activity of polyherbal formulation was assessed by Total Antioxidant Capacity by Phosphomolybdate Assay and DPPH Scavenging Activity. In Phosphomolybdate Assay the polyherbal formulation PHF2 shows the increasing total antioxidant capacity equivalent to Ascorbic acid per gram ( $\mu\text{g AAE/g}$ ) with increasing concentration as compared to polyherbal formulation PHF1 and PHF3. While in DPPH free radical Scavenging assay, the polyherbal formulation (PHF2) shows highest free radical scavenging activity with  $\text{IC}_{50} = 43.57 \mu\text{g/ml}$  when evaluated with standard Ascorbic acid  $48.25 \mu\text{g/ml}$ , PHF3  $62.75 \mu\text{g/ml}$  and PHF1  $88.15 \mu\text{g/ml}$ . Hence, the evolved polyherbal formulation might substantiate to be a safe alternative treatment for the management of chronic metabolic disorders like diabetes, cancer, liver injury, inflammation, skin damages, coronary heart diseases, and arthritis through reducing oxidative stress.

**KEYWORDS:**Oxidative Stress, Chronic Disorder, Polyherbal Formulation, Ascorbic Acid,  $\text{IC}_{50}$ **ARTICLE HISTORY:**Received Aug 22, 2021  
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**INTRODUCTION**

Oxidative stress is a pathological state that is responsible for the growth of chronic disorders like arteriosclerosis, cancer, diabetes mellitus, liver injury, inflammation, skin damages, coronary heart diseases, and arthritis (Resat Apak, 2016) (Dontha, 2016). Oxidative stress is a condition where oxidants overwhelm the antioxidant protective system, which may lead to DNA damage and cellular lipid peroxidation (Garland K. More, 2020). Oxidative stress is owing to the discrepancy between the production of reactive oxygen species (ROS) alongside reactive nitrogen species (RNS) and the antioxidant defenses (Maria Agostina Frezzini, 2019).

Antioxidants are substances that when found in food or herbs or in the body at very low concentrations that stop and stabilize the oxidative damage triggered by free radicals by providing electrons from antioxidants to these damaged cells

(Mahbubur Rahman, 2015). Antioxidants that fit in this definition encompass free radical scavengers, singlet oxygen quenchers, inactivators of peroxides and other reactive oxygen species (ROS), metal ion chelators, quenchers of secondary oxidation products, and inhibitors of pro-oxidative enzymes, among others (Fereidoon Shahidi, 2015). Plants are loaded in antioxidants; so considerable attention has been directed towards the growth of ethnomedicines as they contain phenols, flavonoids, alkaloids, tannins, vitamins, terpenoids, and numerous phytochemicals responsible for different pharmacological activities. Current research has proved that ingestion of natural antioxidants has been linked with a reduced risk of cancer and many chronic diseases (Mayank Gangwar, 2014).

The philosophy behind Ayurveda is preventing needless suffering and living a long healthy life. Unlike the allopathic medicines which adopt mainly synthetic chemical designed

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Name of Author: Dr. S. B. Gholve

Name of the Journal: Journal of Pharmaceutical Research International

ISSN 0975-2366

DOI: <https://doi.org/10.31838/ijpr/2021.13.02.471>**Research Article****Formulation and Evaluation of Dexromethorphan Chocolate for Pediatrics**SACHIN GHOLVE<sup>\*</sup>, DHANASHREE CHANDAK<sup>1</sup>, NARSING KEDAR<sup>1</sup> AND OMPRAKASH BHUSNURE<sup>1</sup><sup>1</sup>Department of Pharmaceutical Quality Assurance, Channabasweshwar pharmacy college (Degree), Latur, Maharashtra, India - 413512.<sup>\*</sup>Corresponding Author

Email ID: sbgholve@gmail.com

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**ABSTRACT**

Chocolate is an anhydrous medium which resistant to microbial growth and to hydrolysis of water-sensitive active agent. Chocolate abundantly contains saturated fat, polyphenols, sterols, di and triterpenes, aliphatic alcohols, methylxanthines, flavanols and antioxidant cocoa. Chocolate drug delivery system has advantage that includes a possible bypass of first-pass effects and avoidance of pre-systematic elimination within the GI tract. The objective of the present study is to develop a palatable chocolate formulation of Dextromethorphan hydrobromide for pediatric administration using Qbd approach. The first generation antihistamine dextromethorphan is classified as an antitussive by the United States Food and Drug Administration to inhibit cough reflex sensitivity in subjects with pathological cough. In present work, firstly chocolate base is prepared by using cocoa butter, cocoa powder, lecithin and pharmaceutical grade sugar. Then therapeutic drug is incorporated to prepared chocolate base. The prepared medicated chocolate is evaluated for appearance, moisture content, in-vitro drug release, blooming test, drug content determination and drug excipients compatibility by FTIR Spectroscopy. The drug release from chocolate shows First order kinetics and diffusion mechanism. Among all formulations the formulation F5 showed complete release of DXM with 98.77% at the end of 1 hour. The prepared formulations has no drug excipient interactions and there has no degradation in drug. It is stable during chocolate formulation preparation.

**Keywords:** Chocolate, Medicated Chocolate, In vitro drug release, Pediatrics.**INTRODUCTION**

Nowadays, one of the most popular food all over the world is Chocolate. Chocolate has highly nutritious energy, fast metabolism and good digestibility. Chocolate is a highly sophisticated food that can be combined to create completely different taste and texture sensations. The new trend in food manufacturing is functional or health promoting foods like chocolate. Chocolate prevent illnesses such as heart disease, antioxidant, diabetes, improving memory, improving cardiac functioning, fighting against tooth decay, muscle relaxation, anti-cancer and anti-inflammatory properties. The flavor of chocolate resides a volatile aromatic fraction of flavor-active component as well as in non-volatile components influencing taste perception. The complex composition of the chocolate is depends on the cocoa bean genotype. The organoleptic characteristics of drugs like bitter and unpleasant flavour can be masked by chocolate. With demand for innovative and highly efficient quality pharmaceutical product so formulators consider new and creative ways to deliver actives, they can realize the full capabilities of providing enhanced

safety, reduced side effects, enhanced multi functionality, improved ingredient compatibility and improved stability.

One of the best route for the patient compliance and pediatrics is nothing but the oral route. Oral route has its own advantages also has its own disadvantages too. Drugs having first pass metabolism cannot be administered through oral route. A novel drug delivery system has been developed by researcher i.e. Chocolate drug delivery system (medicated chocolate).<sup>(10)</sup> By keeping the universal problem of pediatrics in mind most of the pharma companies coming out with various innovative formulations such as disintegrating tablets, dry syrups, lozenges, oral films, etc. the organoleptic properties of chocolate are excellent for masking unpleasant flavours associated with some active agent for delivering drug and giving a smooth and creamy texture to composition of active agents that are otherwise undesirably gritty.

Complemented by novel development approaches and creative formulation techniques, chocolate delivery systems can be a promising strategy for a new generation of pharmaceuticals



  
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Title of the Paper- Formulation and Evaluation of Topical Microemulgel Containing Terbinafine Hydrochloride

Name of Author- Dr. S.N. Nagoba

Name of the Journal- Journal of Pharmaceutical Research International



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### Formulation and Evaluation of Topical Microemulgel Containing Terbinafine Hydrochloride

Zingade Sarika G.<sup>1</sup>, Nagoba Shivappa N.<sup>1\*</sup>, Agwane Shanta G.<sup>1</sup> and Swami Avinash B.<sup>1</sup>

<sup>1</sup>Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

#### Authors' contributions

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

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#### ABSTRACT

The purpose of this study is to create and test a Terbinafine hydrochloride microemulgel. Terbinafine hydrochloride is an FDA-approved antifungal medication used to treat fungal infections on the skin. It's a BCS class II medication with little bioavailability. In the realm of pharmaceutical sciences, microemulgel has evolved into one of the most intriguing topical preparations. Microemulgel as a delivery technique has several advantages over simple traditional formulations, including simplicity of administration, increased residence duration at the application site, consistent drug release with improved bioavailability, superior thermodynamic stability, and excellent transdermal permeability. Terbinafine hydrochloride microemulgels were made with carbopol 940 and HPMC as gelling agents, oleic acid as an oil, parabens as a preservative, and tween 20 as an emulgent and penetration enhancer. The appearance, spreadability, homogeneity, viscosity, pH, percent drug content, and in vitro diffusion studies of the generated microemulgel formulation were all visually checked. The findings show that developing a terbinafine-containing microemulgel is more effective, but clinical efficacy must be determined through clinical trials.

Keywords: Microemulgel; terbinafine hydrochloride; carbopol 940; HPMC; penetration enhancer.

\*Corresponding author: E-mail: [nagobashivappa@gmail.com](mailto:nagobashivappa@gmail.com), [nshivraj11@rediffmail.com](mailto:nshivraj11@rediffmail.com).



  
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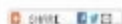


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**Title of the Paper:** Formulation and Evaluation of Transdermal Patch containing Antihistaminic Drug Bilastine**Name of Author:** Dr. S. N. Nagoba**Name of the Journal:** International Journal of Biology, Pharmacy and Allied Sciences

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**International Journal of Biology, Pharmacy  
and Allied Sciences (IJBPAS)***'A Bridge Between Laboratory and Patient'*[www.ijbpas.com](http://www.ijbpas.com)**FORMULATION AND EVALUATION OF TRANSDERMAL PATCH  
CONTAINING ANTIHISTAMINIC DRUG BILASTINE****GADEKAR PRASAD, NAGOBA SHIVAPPA N<sup>\*</sup>, SWAMI AVINASH, DHIRAJ  
SURYAWANSHI, ANUJ PORWAL, SHINDE VIJAY**Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra,  
India**\*Corresponding Author: Prof. Dr. Nagoba Shivappa N.; E Mail: [nagobashivraj@gmail.com](mailto:nagobashivraj@gmail.com)**Received 19<sup>th</sup> Aug. 2021; Revised 30<sup>th</sup> Sept. 2021; Accepted 29<sup>th</sup> Oct. 2021; Available online 1<sup>st</sup> Dec. 2021<https://doi.org/10.31032/IJBPAS/2021/10.12.2025>**ABSTRACT**

The present investigation was aimed to formulate and evaluate Matrix- type Transdermal delivery system containing an antihistaminic drug, Bilastine with different polymer concentration by the solvent casting technique & explore the effect of polymers on the in-vitro drug release of Bilastine across skin Matrix. The present investigation aims to formulate and evaluate of medicated skin patches for the treatment of Urticaria. Skin patches were prepared by using hydroxyl propyl methyl cellulose HPMC K100 and Eudragit RS 100 as polymers, ethyl cellulose as plasticizer, PEG-4000 as permeation enhancers and chloroform as solvent. Prepared patches were subjected to different evaluation studies in which permeation studies were performed by using Franz diffusion cell apparatus, folding endurance, thickness, weight variation, percentage moisture uptake, etc. The results showed that F5 batch found were optimized i.e. thickness 0.11mm, weight variation about 2%, folding endurance about 103 folds, moisture uptake 1.03%, and showing drug assay about 97.57% with drug release in first hour 9.12 and cumulative drug release of 75.71%. The stability study proved that optimized batch was stable at accelerated stability conditions.

**Keywords: Transdermal, Urticaria, Permeation enhancer, In-vitro permeation study****INTRODUCTION**

Topical therapy is highly desirable in treating skin allergies due to its localized effects, which results in minimal adverse systemic events and possibly

improved adherence. However, the effectiveness of topical therapies is limited by minimal drug permeability through the skin plate. Skin allergies are a very

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**Title of the Paper:** Formulation Development and Evaluation of Liposomal Drug Delivery System Containing Etoposide

**Name of Author:** Dr. S. N. Nagoba

**Name of the Journal:** Journal of Complementary Medicine Research

**RESEARCH ARTICLE**

# Formulation Development and evaluation of Liposomal Drug Delivery System Containing Etoposide

**FUGATE AJAY R<sup>1</sup>, NAGOBA SHIVAPPA N.<sup>2\*</sup>, S. R. HYAM<sup>3</sup>**<sup>1</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India, E-mail: nagobashivra@gmail.com, nshivra11@rediffmail.com<sup>2</sup>Vijayrao College of Pharmacy, Hatval, Kankavali, Maharashtra, India.<sup>3</sup>Corresponding Author**ABSTRACT**

Two most commonly used preparative methods, reverse phase evaporation and ethanol injection were employed to prepare cationic liposomes composed of Etoposide API, DMPG-Na polymer and Cholesterol binder, respectively. To overcome the hindrances of the reported HPLC analytical method in pharmacopeia which requires more time in preparation for solvent and also its bit tedious; we have developed and validated a simple method which will be applicable to detect and quantify actual drug in formulation as well as it can be applied for pharmacokinetics study. The resulting formulations were evaluated through morphology observation, particle size and zeta potential analysis, % entrapment efficiency and % drug loading. The results showed that liposomes prepared by ethanol injection method were of best quality and stability, with promising results. However ETNLE 5 shows best results i.e. particle size  $197.3 \pm 0.21 \text{ nm}$ , polydispersity index  $0.340 \pm 0.051$ , and zeta potential of about  $-12.7 \pm 1.266 \text{ mV}$ . Entrapment efficiency  $81.78 \pm 0.78\%$  and drug loading  $89.62 \pm 2.53\%$  is the highest as compared to all other batches. % In-vitro Drug release study showed 15% and 21% of drug was released in the first five minutes with a cumulative drug release of 58% and 78% for ETNLE 5 formulation at pH 1.2 and pH 6.4 respectively. Stability study of optimized batch showed no significant changes in evaluation parameters. Cell viability study on A-549 cells by MTT assay clarified cancer cells are inhibited by 200  $\mu\text{M}$  equivalent etoposide liposomes as compared to 64.88% of free drug. These findings clarified the effect of preparative methods on performance of cationic liposome, as well as formulation factors on entrapment efficiency, and will provide important methodological reference for further study of liposomes carriers for drug delivery to tumor penetration.

**KEYWORDS:**

Etoposide, Liposome, Entrapment efficiency, Ethanol injection, Reverse phase evaporation.

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**INTRODUCTION**

The death rate due to cancer is still growing worldwide [1, 2]. Thus, the research related to the disorder and its treatment is continuously at spotlight. The different clinical strategies like therapies and drug delivery systems have been restructure and rediscovered on regular and at rapid rate. The combinational therapies need to be paid crucial observations as the drugs have very small therapeutic index [3]. There are various challenges like pharmacokinetics, in-vivo distribution (especially when drugs are given in combination), the specificity of tumor target, accumulation of drug. Even the high number of side effects hampering the health more during the treatments [4].

Nano-based drug delivery system (NDDS) in this case has been proved to be essentially efficient choice line of treatment. It has ability to overcome many of the pharmaceutical and clinical hurdles which are faced during the chemotherapy. NDDS exhibits improved drugs stability, desired Pharmacokinetics patterns, targeted delivery system [5, 6, 7]. It also increases possibility of combination of different type of drugs in a single formulation, thus holds a big share in developing effective chemioimmunotherapy regimens.

Liposome is one of the most widely explored area in NDDS [5]. It has huge applicability by inducing different manipulations in the structure as well as the excipients used. The spectrum of variations in this delivery system that are



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**Title of the Paper:** Novel 5-fluorouracil-Embedded non-woven PVA - PVP electrospun nanofibers with enhanced anti-cancer efficacy: Formulation, evaluation and in vitro anti-cancer activity

**Name of Author:** Dr. O.G. Bhusnure

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Research paper

### Novel 5-fluorouracil-Embedded non-woven PVA - PVP electrospun nanofibers with enhanced anti-cancer efficacy: Formulation, evaluation and in vitro anti-cancer activity

Omprakash Gadgappa Bhusnure<sup>a,\*</sup>, Sachin Bhagwat Gholve<sup>b</sup>, Padmaja Sidram Giram<sup>b</sup>, Abhimanu Vilas Galkwad<sup>c</sup>, Ubaidulla Udumansha<sup>d</sup>, Ganesh Mani<sup>e</sup>, Jang Hyun Tae<sup>f,g</sup>

<sup>a</sup> Department of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Latur, Maharashtra, 413512, India

<sup>b</sup> Department of Pharmacology, Channabasweshwar Pharmacy College (Degree), Latur, Maharashtra, 413512, India

<sup>c</sup> Department of Pharmaceutics, Channabasweshwar Pharmacy College (Degree), Latur, Maharashtra, 413512, India

<sup>d</sup> Department of Pharmaceutics, C. G. And Mehta College of Pharmacy, Channas, India

<sup>e</sup> Dept of Chemical Engineering, Hansoo University, 40 Hansoo 1-ro, Hansoo-gu, Seoul, S, Chungcheongnam-do, South Korea

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H29 colon cancer cell

**ABSTRACT**

In this study we describe the development of an effective nanofiber (NF) formulation that uses two low-cost and easily available polymers, PVA and PVP, to embed and release a well-known anticancer drug, 5-Fluorouracil (5FU), which is intended to treat colon cancer. PVA/PVP polymers in a variety of ratios (10:2, 8:4, 6:6, 4:8, 2:10) were used for NF fabrication to find the optimum composition. The selected NF composition (10:2 PVA: PVP) was then characterized by UV-Visible spectroscopy, Fourier-Transform Infrared spectroscopy (FTIR), Scanning Electron Microscopy (SEM), and Powder X-Ray Diffraction (PXRD). The FTIR results demonstrate effective loading of the drug into the polymer matrices, this is further supported by a decrease in the intensity of the 5-FU crystallinity peak shown in the PXRD results. Drug loading experiments showed that approximately 95.97, 94.48 and 93.22% of 5-FU was successfully loaded to the selected NFs when 10, 20 and 30% initial proportions of the drug, respectively, were added. Entrapment efficiencies of 91.2, 93.85 and 96.06% by the PVA-PVP NF were achieved from initial 5-FU proportions of 10, 20 and 30%, respectively. Drug release experiments show that all of the drug-loaded NFs exhibit an initial burst of elevated drug release followed by slow sustained release over a period of more than 20 h that follows a Fickian diffusion mechanism ( $n > 0.5$ ), we believe this mechanism controls release of the drug by a combination of diffusion and erosion. An in vitro cytotoxicity evaluation of the nanofibers against a human colorectal adenocarcinoma cell line (HCT29) showed enhanced anti-cancer performance, suggesting additional advantages of these fluorouracil nanofibers.

**1. Introduction**

Colon cancer is a fatal disease that is a major cause of death worldwide. The expected growth of the global colorectal cancer (CRC) population is estimated at 60%, this means that more than 2.2 million new cases and 1.1 million deaths are expected to occur by 2030. A rapid increase in CRC incidence and mortality rates is now being seen in many developed countries, particularly in Europe, Asia and South America, these increases are thought to be caused by changes in lifestyle and eating habits. Currently, the primary choice of treatment is surgical removal, but early detection and resection is crucial for successful

treatment of colorectal cancer. However, recently, the chemotherapeutic drugs that are widely used to treat CRC have been shown to lead to various types of toxicity due to their low efficacy and high required doses [1–3]. Most conventional oral dosages designed for CRC treatment are ineffective at delivering drugs to the colon due to absorption and/or degradation of the active ingredient in the upper gastrointestinal tract (GIT). Therefore, colon-specific drug delivery systems that can deliver drugs directly to the lower gastrointestinal tract without being affected by the environment of the upper GI tract, are expected to lead to a decreased incidence of side effects and give improvements to the quality of life of patients suffering from colon-specific diseases [4].

\* Corresponding author.

\*\* Corresponding author.

E-mail addresses: [omprakashbhusnure@gmail.com](mailto:omprakashbhusnure@gmail.com) (O.G. Bhusnure), [sbgholve@gmail.com](mailto:sbgholve@gmail.com) (S.B. Gholve), [hjtang@hansoo.ac.kr](mailto:hjtang@hansoo.ac.kr) (J.H. Tae).<https://doi.org/10.1016/j.jddst.2021.102654>

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**Title of the Paper:** Pharmacokinetic Profile of Polyherbal Tablets Comprising Extracts of Antidiabetic Medicinal Plants**Name of Author:** Dr. S. N. Nagoba**Name of the Journal:** Journal of Drug Delivery Science and Technology**JOURNAL OF COMPLEMENTARY  
MEDICINE RESEARCH****RESEARCH ARTICLE****Pharmacokinetic Profile of Polyherbal Tablets  
Comprising Extracts of Antidiabetic Medicinal  
Plants.****MOHOLKAR APARARK V.<sup>1</sup>, JADGE DHANRAJ R.<sup>2</sup>, NAGOBA SHIVAPPA N.<sup>3\*</sup>**<sup>1</sup>Channabasweshwar Pharmacy College (Degree) Latur Maharashtra, India.<sup>2</sup>Women's College of Pharmacy, Peth Vadgaon, Kolhapur, Maharashtra, India.<sup>3</sup>Channabasweshwar Pharmacy College (Degree) Latur Maharashtra, India, Email- nagobashivra@gmail.com

\*Corresponding Author

**ABSTRACT**

Diabetes is a chronic metabolic disease that affects millions of individuals across the world and has a significant impact on human existence. Diabetes mellitus is a well-known endocrine condition that is becoming increasingly prevalent in India. In this study, using suitable animal models, researchers evaluated an extract produced from *Gymnema Silvestre* leaves, *Momordica charantia* fruit juice extract, and *Synzgium cumini* seeds extract for pharmacological activities such as antihyperglycemic and antidiabetic activity. Following that, nanoparticles were created and characterised utilising a variety of techniques. Following that, a polyherbal tablet was developed and tested in a variety of pre and post compression conditions. Finally, the pharmacokinetic characteristics of a made-from-scratch polyherbal tablet was compared to a commercially available formulation.

**KEYWORDS:**Diabetes, Polyherbal Tablets, *Gymnema Silvestre*, *Momordica charantia*, *Synzgium cumini*.**ARTICLE HISTORY:**

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**1. INTRODUCTION**

Diabetes is a chronic metabolic disease that affects millions of individuals across the world and has a significant impact on human existence. Diabetes mellitus is a well-known endocrine condition that is becoming increasingly prevalent in India. It's possible that lifestyle and hereditary factors are to blame. Diabetic monocytes generate more superoxide anion as a result of these variables. Diabetes is a key risk factor in patients with early atherosclerosis and oxidative stress. Diabetes is a condition characterised by inadequate insulin production or increased insulin resistance. Herbal medicines are commonly employed to treat this chronic illness, however herbal diabetes therapies have shown to be effective in individuals with insulin-dependent diabetes.

insulin-dependent diabetes, diabetic retinopathy, diabetic peripheral neuropathy, and other conditions. Diabetes is rapidly affecting the global population, particularly type 2 diabetes, which affects 90-95 percent of the population and is caused by impaired insulin production or consumption, according to the World Health Organization, which estimates that it will affect 300 million or more people by 2025. Many oral hypoglycemic medications, such as biguanides, glinides, and sulfonylureas, are used to control diabetes today, but many have negative side effects, thus research is mostly focused on finding safer antidiabetic drugs. [1-14] Herbal remedies have been a key source of medications for the prevention and treatment of illnesses, including diabetes mellitus, for millennia. There are about 200 plant species that have hypoglycemic characteristics. Diabetic treatment

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**Title of the Paper:** Phytochemical Study on Sesbania Sesban Isolated Phytoconstituents for In-Vivo Anti-Inflammatory and In-Vitro Antioxidant & Anticancer Activity.

**Name of Author:** Dr. S.N. Nagoba

**Name of the Journal:** Journal of Drug Delivery Science and Technology



## PHYTOCHEMICAL STUDY ON SESBANIA SESBAN ISOLATED PHYTOCONSTITUENTS FOR IN-VIVO ANTI-INFLAMMATORY AND IN-VITRO ANTIOXIDANT & ANTICANCER ACTIVITY.

CHANDRAWADAN V. PANCHAL<sup>1</sup>, DHANRAJ R. JADGE<sup>2</sup>, SHIVAPPA N. NAGOBA<sup>3\*</sup>, SIDHESHWAR S. PATIL<sup>4</sup>

<sup>1</sup>School of Pharmacy, SRTMU, Nanded, Maharashtra, India- 431806.

<sup>2</sup>Women's College of Pharmacy, Peth Vadgaon, Dist. Kolhapur, Maharashtra, India- 416112.

<sup>3</sup>Channabasweshwar Pharmacy College, Kava Road, Latur, Maharashtra, India- 413512, Email- nagobashivraj@gmail.com

<sup>4</sup>Maharashtra College of Pharmacy Nivanga, Dist. Latur, Maharashtra, India - 413521.

\*Corresponding Author

### ABSTRACT

Sesbania sesban Linn belongs to the Fabaceae family, which is found in tropical and subtropical parts of the world. Other members of this family include Sesbania aculeata, Sesbania drummondii, Sesbania grandiflora, Sesbania rostrata, and Sesbania speciosa. The goal of this research is to conduct a phytochemical analysis as well as an in-vivo anti-inflammatory, in-vitro antioxidant and anticancer investigation of phytoactive extracts. All sections of the plant were examined for organoleptic characteristics, additional features, and macroscopical details. The foreign organic matter, moisture content, total ash value, water-soluble ash value, acid-insoluble ash value, water-soluble extractive value, and alcohol soluble extractive value of powdered Sesbania sesban leaves were all evaluated. For improved separation of the components, n-butanol extracts of Sesbania sesban leaves were treated to TLC using a suitable solvent system. The presence of secondary metabolites such as flavonoids, Glycosides, tannins, and phenolic substances is confirmed by TLC analysis of extracts. Furthermore, the TLC of flavonoid and glycosides was highly resolved, indicating that they were present in greater quantities. In-vivo anti-inflammatory, In-vitro antioxidant and anticancer studies (Cell line-A549) on phytoactive extracts (S53, S54) were conducted and shown to have excellent efficacy.

### KEYWORDS:

Extraction, characterization, Sesbania sesban, in-vivo anti-inflammatory activity, in-vitro antioxidant study, anticancer study.

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### INTRODUCTION

The Sesbania genus in the Fabaceae family has over 60 species of annuals, perennials, herbs, shrubs, and trees that may be found in tropical and subtropical regions all over the world. The most popular Sesbania species include Sesbania aculeata, Sesbania bispinosa, Prickly sesban, Dhaincha, Sesbania cannabina Agathi, Agasti, Sesbania rostrata Manila Agathi, Sesbania Dhaincha, and Sesbania sesban. Sesbania species prefer humid areas with uniformly distributed rainfall throughout the year to humid climates with alternating wet and dry spells.

Surprisingly, Sesbania species are known for their remarkable tolerance to a variety of soil, geographic, and climatic conditions, including saline and sodic soils, soil with high electrical conductivity (10mS cm<sup>-1</sup>), high alkalinity (pH 10), drought, waterlogging, high annual temperature (36-44 °C), and rainfall (570 2210 mm) with little or no input. Animals eat the leaves, flowers, pods, and seeds of Sesbania. [1,2] Sesbania leaves are considered a high-quality animal feed because they contain 30% protein and a good amino acid profile, leading to enhanced milk and meat production. Protein content is 29-33 percent, lipid content is 4.7-6%. There content



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Phone No. (02382) 240192, Fax-(02382) 243855

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Title of the Paper: Preparation and Standardization of Egg Shell Bhasma

Name of Author: Dr. R. S. Sakhare

Name of the Journal: International Journal of Pharmaceutical Sciences and Drug Research

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**Preparation and Standardization of Egg Shell Bhasma**Miss. Mayuri J. Chandrawanshi<sup>1</sup>, Dr. Ram S. Sakhare<sup>2</sup>, Dr. Shivappa N. Nagoba<sup>3</sup>, Miss. Shraddha.G. Patewar<sup>4</sup><sup>1</sup>Assistant Professor, Department of Pharmaceutics, Shivlingeshwar College of Pharmacy, Almala, Latur-413512 Maharashtra, India<sup>2,3,4</sup>Channabasweshwar Pharmacy College (Degree), Latur-413512 Maharashtra India

**Abstract** - Egg shell bhasma was prepared by using eggshell as a raw material. It is the rich source of calcium and shows more bioavailability along with maximum therapeutic effect with minimum side effects as compared to synthetic calcium sources. Egg shell bhasma was prepared by using standard classical methods. Egg shell bhasma was analysed by ancient methods like nirgaadh, Verna, varitwaratva Rekhapurnatva, unama and some advanced methods of analysis like X-Ray Diffraction, FTIR, Namburi Phased Spot Test etc. Amount of calcium present in it was determined by using EDTA titration.

**Index Terms** - Egg shell, standardization, bhasma, calcium.

**INTRODUCTION**

Ayurveda is one of the leading and popular traditional Indian systems of medicine. Bhasma is unique formulation belonging to Ayurveda. This group of medicines can work even in smaller dose as well as controls incurable diseases effectively. Products obtained from mineral metals, are supposed to be unfavourable to human body. But it is very shocking to know that in rasa-shasatra text the side effects are previously mentioned if we utilize these medicines if they are not prepared appropriately. Most of animal derivatives such as feathers, horns, shells, metallic and non-metallic minerals are normally administered in the form of bhasma.

Egg shell bhasma<sup>(1-9)</sup>

Egg shell is converted to their bhasma forms which reduces side effects of crude shell and convert them into fine powder which increases absorption of that particular drug. Egg shell bhasma is not only rich in calcium but also contains other trace minerals which promotes absorption. It is the natural novel dietary supplement contains richest source of calcium,

proteins and elements like strontium, magnesium, selenium and fluorine etc. Egg shell bhasma shows positive effect in increasing bone mineral density and stimulates chondrocyte differentiation and cartilage growth. Assimilation of Egg shell bhasma which is not present in synthetic calcium supplements. It is used for the treatment of diseases like leucorrhoea i.e. vaginal white discharge, menorrhagia, gonorrhoea, diabetes mellitus, urinary tract infection, mental disorder. It also has the properties like rasayana i.e. immunomodulation and balya i.e. strength. Egg shell bhasma is used for the treatment of some health conditions disorders related to muscle, one and joints like low mineral density, osteoporosis, osteopenia, osteomalacia, osteoarthritis, low backache (in case of women), vaginitis, and frequent urination. It is also utilise in the treatment of hair care by promoting hair growth and delays hair fall.

**Synonym:** - In Ayurveda hen's eggshell is also known as kukkutanda tvak, kukkutanda tvak bhasma, kukkutanda dala, shvetanda bhasma, dakshanda tvak, niyodha, dahar, yamnadi etc.

**Class:** - Sudhaverga.

**MATERIALS AND METHODS**

Hens' eggshell, aloe vera juice was obtained from our botanical garden, citric acid was purchased from Meher chemie B203, Mumbai-67

**PREPARATION OF EGG SHELL BHASMA<sup>(9-10)</sup>**

Egg shell bhasma is prepared by using following methods



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**Channabasweshwar Pharmacy College (Degree)**

Kava Road, Basweshwar Chowk, Latur-413512 (Maharashtra)

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Email- channabasweshwar@gmail.com Website- www.cdphl.org

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Title of the Paper- QBD Based RP-HPLC Method Development and Validation for the Estimation of Quetiapine in the Presence of Related Substances

Name of Author- Sachin Gholve

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ORIGINAL ARTICLE

OPEN ACCESS

### QBD Based RP-HPLC Method Development and Validation for the Estimation of Quetiapine in Presence of Related Substances

Sachin Gholve<sup>\*1</sup>, Jaiprakash Sangshetti<sup>1</sup>, Omprakash Bhusnure<sup>2</sup>, Vijayendra Swamy<sup>2</sup>, Sanjay Thonte<sup>3</sup>

<sup>1</sup>Dept. of Quality Assurance, Y. B. Chavan College of Pharmacy, Dr. Rafiq Zakaria Campus, Rauza Baugh, Aurangabad, Maharashtra, India - 431001

<sup>2</sup>Channabasweshwar Pharmacy College (Degree), Kava Road, Latur, Maharashtra, India - 413512

<sup>3</sup>Channabasweshwar Pharmacy Polytechnic, Kava Road, Latur, Maharashtra, India - 413512

Corresponding Author Email - [sbgholve@gmail.com](mailto:sbgholve@gmail.com)

#### ABSTRACT

A rapid specific RP-HPLC method has been developed for the estimation of quetiapine impurities in the formulation. The control of pharmaceutical impurities is currently a critical issue in the pharmaceutical industry. The ICH has formulated a workable guideline regarding the control of impurities. The objective of the present study was to develop and validate a RP-HPLC method for the quantitative determination of process-related impurities of Quetiapine in pharmaceutical formulation. Quetiapine, [2- (2-(4-dibenzo [1, 4] thiazepine-11-yl-1-piperazinyl) ethoxyethanol is an antipsychotic drug used in the management of schizophrenia and bipolar disorder. Chromatographic identification of the impurities was carried out on Waters Symmetry C<sub>8</sub>, 250 x 4.6mm, 5µm column is used for the development of the method. The mobile phase consists of buffer and acetonitrile. The flow rate of the mobile phase was 1.0 mL/min with gradient elution. The column temperature is ambient and the detection wavelength is 290 nm. The injection volume is 10 µL. The method was validated as per ICH guidelines for linearity in the range of 50-150 % and the LOD & LOQ values obtained were 0.0000437 and 0.0001325 µg/ml respectively which specifies the method's sensitivity. The proposed method was successfully used to determine the Quetiapine formulation impurities.

**Keywords:** Quetiapine, RP-HPLC, Impurities, linearity, Validation.

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#### INTRODUCTION

Quetiapine fumarate chemically known as [2- (2-(4-dibenzo [1, 4] thiazepine-11-yl-1-piperazinyl) ethoxyethanol, molecular weight: 615.66—a dibenzothiazepine derivative, is one of the most recent antipsychotic drugs used for the treatment of schizophrenia and for the treatment of acute manic episodes associated with bipolar disorder. An oral antipsychotic drug that acts as an antagonist of multiple neurotransmitters including serotonin and norepinephrine is used in the treatment of schizophrenia. It is a selective monoaminergic antagonist with high affinity for the serotonin type 2 (5HT<sub>2</sub>) and dopamine type 2 (D<sub>2</sub>) receptors (1,2). This antipsychotic has a low incidence of extrapyramidal side effects and tardive dyskinesia as compared to older antipsychotics (3). Pharmaceutical impurities are unwanted chemicals that coexist with the active pharmaceutical ingredient (API) or develop during the formulation or ageing of both API and formulated APIs into medicines. Even small concentrations of these impurities can have an impact on a drug's effectiveness and safety (4). There are various types of sources of impurities that are affected by products. That is synthesis related impurity, ii) organic impurity and, iii) inorganic impurity (5). The International Conference on Harmonization (ICH) of technical requirements for registration of pharmaceuticals for human use ICH has also published guidelines for validation of methods for analyzing impurities in new drug substances, products, residual solvents, and microbiological impurities (6). In the overwhelming majority of the pharmacopoeial monographs, impurities in the active pharmaceutical ingredient are determined by selective (usually high-performance liquid chromatography (HPLC)) or non-selective (usually titrimetric or ultraviolet (UV) spectrophotometry) methods (7). HPLC is undoubtedly the most important method in drug-impurity profiling. It is widely used for separating and quantifying impurities, and this technique is most frequently used coupled with spectroscopic methods in the identifying and elucidating the structure of impurities (8). Analytical method development and validation play important roles in drug discovery, Drug

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### RP-HPLC Method Development and Validation for the Estimation of Lansoprazole in Presence of Related Substances by QbD Approach

Sachin B. Gholve<sup>1\*</sup>, Jaiprakash N. Sangshetti<sup>1</sup>, Omprakash G. Bhusnure<sup>2</sup>,  
Ram S. Sakhare<sup>2</sup>, Pratap H. Bhosale<sup>3</sup> and Md. Ismail Mouzam<sup>1</sup>

<sup>1</sup>Y. B. Chavan College of Pharmacy, Dr. Rafiq Zakaria Campus, Rauza Saugh, Aurangabad- 431001, Maharashtra, India.

<sup>2</sup>Channabasweshwar Pharmacy College (Degree), Kava Road, Latur- 413512, Maharashtra, India.

<sup>3</sup>Channabasweshwar Pharmacy Polytechnic, Kava Road, Latur- 413512, Maharashtra, India.

#### Authors' contributions

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#### ABSTRACT

A rapid specific RP-HPLC method has been developed for the determination of Lansoprazole impurities in the drug substance. The control of pharmaceutical impurities is currently a critical issue in the pharmaceutical industry. The International Council for Harmonization (ICH) has formulated a workable guideline regarding the control of impurities. The objective of the recent study was to develop and validate a HPLC method for the quantitative determination of process-related impurities of Lansoprazole in pharmaceutical drug substance. Lansoprazole, 2-[[[3-methyl-4-(2,2,2-trifluoroethoxy)-2-pyridinyl] methyl]-sulfinyl]-1H-benzimidazole is a proton pump inhibitor used in the management of gastric ulcers. Chromatographic identification of the impurities was carried out by response surface methodology, applying a three-level Box Behnken design with three center points. Three factors selected were a mobile phase, flow rate, column temperature. Evaluation of the main factor, their interaction, and the quadratic effect on peak resolution were done on Waters Symmetry C<sub>18</sub>, 250 x 4.6mm, 5µm column is used for the development of the method.

\*Corresponding author: E-mail: sgholve@gmail.com



  
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**STABILITY INDICATING HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY METHOD FOR SIMULTANEOUS ESTIMATION OF ACEBROPHYLLINE AND DOXOXYLLINE IN PHARMACEUTICAL DOSAGE FORM**

Ram S. Sakhare<sup>1</sup>, Sanjay S. Pekamwar<sup>2</sup> and Narendra Gangadharrao Patre<sup>3</sup>

Department of Quality Assurance, Channabasweshwar Pharmacy College (Degree)<sup>1</sup>, Latur - 413512, Maharashtra, India.

Department of Pharmaceutical chemistry, School of Pharmacy, SRTM University<sup>2</sup>, Nanded - 431606, Maharashtra, India.

DK Patil Institute of Pharmacy<sup>3</sup>, Loha, Dist, Nanded - 431708, Maharashtra, India.

**Keywords:**

Acebrophylline, Doxofylline, RP-HPLC, Stability, Stress degradation.

**Correspondence to Author:**

**Dr. Ram S. Sakhare**

Department of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Latur - 413512, Maharashtra, India.

**E-mail:** ramsakhare85@gmail.com

**ABSTRACT: Objective:** To develop a simple, selective, and precise stability-indicating high-performance liquid chromatography method for the simultaneous estimation of acebrophylline and doxofylline in bulk and tablet dosage form. **Methods:** The chromatographic separation achieved on HiQSil C18 Column (250 × 4.6 mm, 5µm) utilizing a mobile phase Acetonitrile: 10 mM n-hexane sulfonic acid buffer (80: 20, v/v) at a flow rate of 1.0 ml/min with injection volume 20 µl. UV detection was performed at 250 nm. The method was validated as per ICH guidelines. **Results:** The retention time for acebrophylline and doxofylline was found to be 2.77 min and 9.56 min, respectively. The linear regression analysis data for the calibration plots showed a good linear relationship in the concentration range of 1-10 µg/ml for acebrophylline and 4-24 µg/ml for doxofylline. The percentage recoveries of acebrophylline and doxofylline in the marketed dosage form were found to be 99.91 and 94.24, respectively. The correlation coefficients for acebrophylline and doxofylline were 0.997 and 0.998, respectively. The percentage degradation at different stress conditions like acid, alkaline, Neutral, oxidative, Dry heat, and photolytic for acebrophylline were found to be 14.84, 10.17, 9.5, 11.34, 0.00 and 5.45 respectively and for doxofylline, found to be 8.19, 11.57, 12.74, 8.38, 9.57 and 11.02 respectively. **Conclusion:** The developed method was successfully validated as per ICH guidelines. This method is simple, selective, linear, precise, accurate, and sensitive and can be applied for routine estimation of tablet dosage forms containing both drugs.

**INTRODUCTION:** Acebrophylline is an anti-inflammatory and airway mucus regulator. It contains ambroxol and theophylline-7-acetic acid. That facilitates the biosynthesis of pulmonary

surfactant while later raises blood levels of ambroxol, by stimulating surfactant production<sup>1</sup>. Chemically acebrophylline **Fig. 1A** is (1, 3-dimethyl-2, 6-dioxo-1, 2, 3, 6-tetrahydro-7H-purine-7yl) acetic acid-4 [((2-amino-3, 5-dibromophenyl) methyl) amino] cyclohexanol.

It is a salt obtained by reaction of equimolar amounts of theophylline-7-acetic acid and ambroxol<sup>2</sup>. Theophylline-7-acetate has a bronchodilator effect due to inhibition of the intracellular phosphodiesterases, followed by an

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**Title of the Paper-** Synthesis and molecular docking analysis of Oxazetidine derivatives for neurological disorders

**Name of Author-** Dr. O.G. Bhusnure

**Name of the Journal-**Journal of medical pharmaceutical and allied sciences

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Research article

**Synthesis and molecular docking analysis of Oxazetidine derivatives for neurological disorders**Lonikar NB.<sup>1</sup>, Sangshetti J.N.<sup>2</sup>, Bhusnure O.G.<sup>1\*</sup>

1. Channabasweshwar Pharmacy College, Channabasweshwar research Centre, Latur, Maharashtra, India

2. Y. H. Chavan College of Pharmacy, Aurangabad, Maharashtra, India

**ABSTRACT**

A series of Oxazetidine (NL1-NL12) from reacting tryptophan and aromatic aldehydes were synthesized in good yields by involving 2-[[4-chlorophenyl] methylenel amino]-3-(1H-indol-3-yl) propionic acid and chloro acetyl chloride as reactive intermediates. All the synthesized derivatives were screened via spectral techniques. Synthesized molecules were virtually screened against Human A2A Adenosine receptor interactions analysis using molecular docking to elucidate CNS potential. Synthesized derivatives showed excellent binding towards the Human A2A Adenosine receptor.

**Keywords:** Oxazetidine, Human A2A Adenosine receptor, Docking, CNS

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**Correspondence:** Bhusnure O.G.\* < o.g.bhusnure@gmail.com

Channabasweshwar Pharmacy College, Channabasweshwar research centre, Kawa road, Basweshwar Chowk, Latur, Maharashtra, India

**INTRODUCTION**

Azetidines, one of the important heterocyclic chemical classes which are extensively researched in the scientific world. Chemically the azetidines is a four-member ring structure that contains nitrogen as heteroatom [1-2]. Importance of the azetidines can be understood by the fact it is a constituent of a number of the key chemical structures, raw materials, and important catalysts. Biologically the azetidines class of molecules is active showing a variety of therapeutic potentials like antimicrobial, anticancer, anti-inflammatory, antidepressant, antitubercular, antimalarial, anticancer, antiviral, antioxidant, and cardiovascular activities [3-11]. In recent literature the physical properties of the azetidines are reported this heterocycle is known as a conformationally puckered rigid structure, having bond angles of 10-20 degrees which depends on the type of substitution which is present on it [1-2]. Due to its attractive nature and diverse physicochemical property space associated with it, the azetidines nucleus has been extensively researched and various chemical methodologies were reported for synthesis. The chemical nature and ring strain associated with it the azetidines have become one of the most difficult chemical scaffolds to prepare, due to this reason very few methods have been successfully applied for the development of a diverse set of azetidines derivatives. Methods used in the synthesis

by C-N Bond Formation, Ring Closure by C-C Bond Formation, Reduction of  $\beta$ -Lactams, and Cyclo addition Reactions have been the most utilized chemical reactions for the synthesis of the azetidines [12]. Azetidines nucleus is not only biologically useful but its chemical applications can be widely observed in the chemical literature. In reactions like ring-opening to acyclic amines, ring expansion to pyrrolidines and another 5-Membered heterocycle, ring expansion to six-member Heterocycles, ring expansion to medium-sized heterocycle azetidines are commonly utilized. Adenosine is one of the important biochemical components which is present in the human body it can be called nucleosides which is one of the important building blocks of the genetic material in the human being. The activity of the adenosine is under the control of the producing/degrading enzymes and receptors like A1, A2A, A2B, and A3 which are specialized receptors that can be classified under G protein-coupled receptors [13-15]. These adenosine receptors are targeted for several ailments, recently the role of the A2A receptor has been proven in neurodegenerative diseases. This research paper reports development of novel Oxazetidine derivatives and their in-silico analysis for potential Adenosine A2A receptor inhibition. 12 different Oxazetidine derivatives have been synthesized and screened in silico

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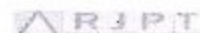
**Name of Author:** Vivek B. Panchabhai

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**RESEARCH ARTICLE**

**Synthesis, characterization and molecular docking studies on some new N-substituted 2-phenylpyrido[2,3-d]pyrimidine derivatives**

Vivek B. Panchabhai\*, Santosh R. Butle, Parag G. Ingole

Department of Pharmaceutical Chemistry, School of Pharmacy,  
Swami Ramanand Teerth Marathwada University, Nanded-431606, Maharashtra, India.

\*Corresponding Author E-mail: vivekpanchabhai82@gmail.com

**ABSTRACT:**

We report a novel scaffold of N-substituted 2-phenylpyrido(2,3 d)pyrimidine derivatives with potent antibacterial activity by targeting this biotin carboxylase enzyme. The series of eighteen N-substituted 2-phenylpyrido(2,3-d)pyrimidine derivatives were synthesized, characterized and further molecular docking studied to determine the mode of binding and energy changes with the crystal structure of biotin carboxylase (PDB ID: 2V58) was employed as the receptor with compounds 6a-r as ligands. The results obtained from the simulation were obtained in the form of dock score; these values represent the minimum energies. Compounds 6d, 6l, 6n, 6o, 6r and 6i showed formation of hydrogen bonds with the active site residues and van Der Waals interactions with the biotin carboxylase enzyme in their molecular docking studies. This compound can be studied further and developed into a potential antibacterial lead molecule.

**KEYWORDS:** Pyrido(2,3-d)pyrimidine, Docking score, Antibacterial, Biotin carboxylase, Molecular docking.

**INTRODUCTION:**

In 2019, the World Health Organization (WHO) released an alarming report on microbial resistance to antibiotics especially in bacteria. The WHO report show a comprehensive picture of data obtained from 114 countries<sup>1</sup>. According to it at least seven different common bacteria cause serious diseases like postoperative infections, blood stream infections, hospital acquired infections and gonorrhoea have become drug resistant. Lot of information regarding the spread of drug resistant microorganisms are available still a big gap is observed in tracking antibiotic resistance. United States alone reported over two million deaths due to bacterial infection and 23,000 deaths due to drug resistant bacterial strains<sup>2</sup>. One of the major reasons for rise of drug resistance is lack of new group of antibiotics. The penicillin was discovered during late 1920s, followed by cephalosporin in late 1940s. After a gap of two decades carbapenams and fluoroquinolones were discovered in the 80s. However, since then no such breakthrough discovery has been reported<sup>3</sup>.

It is known that about 30-40 targets are generally harnessed for drug discovery process against the bacteria, thus there is an urgent need for smart molecules that target novel targets or multiple targets<sup>4</sup>.

The development of techniques like virtual screening, pharmacophore generation, and fragment-based drug discovery, advances in drug delivery has resulted in discovery of newer compounds and validation of newer targets and their proper administration to patients<sup>5,6</sup>. One of the major metabolic pathways found in bacteria is the fatty acid synthesis pathway and has become a popular target among medicinal chemist. In a recent development, the enzyme biotin carboxylase (BC) was found to be a very attractive target for inhibiting the Acetyl CoA carboxylase mediated reaction. BC plays a vital role in Acetyl CoA carboxylase (ACC) catalysed reactions. Biotin carboxylases catalyse the carboxylation of biotin carboxyl carrier protein (BCCP)-biotin in the presence of bicarbonate to form the BCCP-biotin-CO<sub>2</sub>. In the next step, BCCP-biotin-CO<sub>2</sub> transfer the carboxyl group to Acetyl-CoA and forms malonyl-CoA in presence of carboxyltransferase (CT) (Figure 1)<sup>7</sup>.

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Accepted on 18.09.2020 © RJPT All right reserved  
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Phone No. (02382) 240192, Fax-(02382) 243855

Email- [channabasweshwar@gmail.com](mailto:channabasweshwar@gmail.com) Website- [www.cdphl.org](http://www.cdphl.org)

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DTE Code :- 2253, University Code :- 947

**Title of the Paper:** Formulation and Evaluation of Topical Emulgel Containing Terbinafine Hydrochloride  
**Name of Author:** Dr. S. N. Nagoba  
**Name of the Journal:** International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS).

IJBPAS, December, Special Issue, 2021, 10(12): 185-195

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**International Journal of Biology, Pharmacy  
and Allied Sciences (IJBPAS)***'A Bridge Between Laboratory and Reader'*[www.ijbpas.com](http://www.ijbpas.com)**FORMULATION AND EVALUATION OF TOPICAL MICROEMULGEL  
CONTAINING TERBINAFINE HYDROCHLORIDE****AGWANE SHANTA G., NAGOBA SHIVAPPA N.<sup>\*</sup>, SWAMI AVINASH B. AND PATIL  
POOJA Y.**

Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India

**\*Corresponding Author: Dr. Nagoba Shivappa N.:** E Mail: [nagobashivraj@gmail.com](mailto:nagobashivraj@gmail.com)Received 19<sup>th</sup> Aug. 2021; Revised 20<sup>th</sup> Sept. 2021; Accepted 29<sup>th</sup> Oct. 2021; Available online 1<sup>st</sup> Dec. 2021<https://doi.org/10.31032/IJBPAS/2021/10.12.2019>**ABSTRACT**

The aim of the present investigation is to develop and evaluate Terbinafine hydrochloride microemulgel. Terbinafine hydrochloride is FDA approved antifungal drug for treatment of topical fungal infection. It is a BCS class II drug; has poor bioavailability. Now, microemulgel has developed as one of the most interesting topical preparation in the field of pharmaceutical sciences. Microemulgel as a delivery system is advantageous to use such as ease of administration, increased residence time at applied site, steady drug release with improved bioavailability, better thermodynamic stability and high transdermal permeability over simple conventional formulations. The microemulgel of Terbinafine hydrochloride were prepared, using carbopol 940 and HPMC as a gelling agent, oleic acid as oil, parabens as preservative, tween 20 as emulgent and penetration enhancer. The prepared microemulgel formulation was inspected visually for appearance, spreadability, homogeneity, viscosity, pH, % drug content and In vitro diffusion studies. Results obtained has proved that development of terbinafine hydrochloride containing microemulgel will be more effective however its clinical efficacy must be understood using clinical trials.

**Keywords:** Microemulgel, Terbinafine hydrochloride, Carbopol 934, HPMC, penetration enhancer

  
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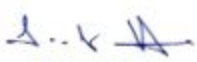


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Phone No. (02382) 240192, Fax-(02382) 243855

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### Research Article

## Design, Formulation and Evaluation of Cabozantinib Loaded Liposome by RP-HPLC

K. B. BHANSALI<sup>1</sup>, S.N. NAGOBA<sup>2\*</sup>, S. R. HYAM<sup>3</sup>

<sup>1</sup>School of pharmacy, SRTM University Nanded, Maharashtra, India.

<sup>2</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

<sup>3</sup>Vijayrao college of pharmacy, Halval, Kankavall, Maharashtra, India.

\*Corresponding Author:

Email: nagobashivraj@gmail.com, nshivraj11@rediffmail.com

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### ABSTRACT

Liposomes were created to deliver drugs to specific locations. The development of an analytical approach to determine the medication contained in the liposome is critical. The goal of the research was to create a reverse phase high performance liquid chromatography (RP- HPLC) method for determining cabozantinib concentration. The method was developed using an Agilent zorbax eclipse XDB C18 column (4.6 x 250 mm, 5μ) with a mobile phase of methanol:0.1 percent OPA (Ortho phosphoric acid) in an 80:20 percent v/v ratio. The mobile phase flow rate was kept constant at 0.7 ml/min. The detection was done at a wavelength of 244 nm. The approach is quick and cost-effective due to the low flow rate and short retention time. The linearity, accuracy, precision, robustness, LOD, and LOQ properties of this approach were all validated. At 80, 100, and 120 percent, the percent recovery was found to be 102.54, 100.65, and 101.04. The percent RSD of intra-day precision was determined to be 0.04, 0.04, and 0.03 whereas the percent RSD of interday precision was 0.07, 0.12, and 0.08. The method that was devised was unique. Cabozantinib had a retention time of 3.651 minutes. 0.0609ppm and 0.1845ppm were found to represent the LOD and LOQ, respectively.

**Keywords:** Method development, validation, liposomes, Cabozantinib, RP- HPLC, ICH.

### INTRODUCTION

Renal cell carcinoma is the most common type of kidney cancer (RCC). It is made up of a variety of cancers that arise from the epithelial cells of the renal tubule (1). Nearly 4,31,288 instances of RCC were reported worldwide, with more than 69,569 cases reported in the United States by GLOBOAN (2.3). Disorder is twice as common in women as it is in men. RCC is diagnosed in around 70% of patients aged 50 and over, with a median age of 64 years at diagnosis (2, 4). Obesity and smoking are the two major causes of RCC (5-7). Nearly 96 percent of RCC instances are random, with only 4% being familial and largely linked to specific gene alterations (8). Inactivation of the Von Hippel-Lindau (VHL) tumour suppressor gene is a common genetic defect in both sporadic and familial clear cell RCC (9). Angiogenic and vascularized tumours are the result of VHL dysfunction (10). As a result, systemic treatment focused on the development of the angiogenic axis. TKIs with anti-angiogenic action (sunitinib, pazopanib, sorafenib, and axitinib), the VEGF-targeted monoclonal antibody bevacizumab, and the mTOR inhibitors everolimus and temsirolimus were allowed for the RCC (11). The FDA has authorised three new

second-line RCC treatments in the recent decade: the immune checkpoint inhibitor nivolumab (12), the TKI lenvatinib in combination with the mTOR inhibitor everolimus (12,14), and the TKI cabozantinib, which is the focus of this investigation (12,15). (15,16). Cabozantinib is an efficient tyrosine kinase inhibitor that targets AXL, MET, VEGF receptors, and other receptors implicated in tumour formation and progression (17). In mice models of breast malignancies, lung cancers, and glioblastomas, the potency of the medication was determined to disrupt tumour vasculature, inhibit tumour and endothelial cell proliferation, and prevent tumour growth (17). Cabozantinib is a medication that is hydrophobic in nature. Because of its insolubility in aqueous solvents like water, a medicine packaged in a capsule or powder and delivered orally must be examined for clinical and preclinical investigations. to maintain a drug's plasma concentration, which can be approximated from the drug's daily dose In animal experiments, 10mM of hydrochloric acid was added to saline to improve the solubility of the medication in aqueous solvent (17). Because of their size, hydrophilic and hydrophobic properties, liposomes play an

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Email- channabasweshwar@gmail.com Website- www.cdphl.org

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DTE Code :- 2253, University Code :- 947

**Title of the Paper :** Development & Validation of Analytical Method for Spectroscopic Estimation of Crisaborole .

**Name of Author :** Dr. S. N. Nagoba

**Name of the Journal :** International Journal of Pharmaceutical Research

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**Title of the Paper:** Development and Characterization of Tamarindus Indica-Phospholipids Complex as An Effective Phytoconstituents Delivery System By QBD Approach.

**Name of Author:** Dr. O. G. Bhusnure

**Name of the Journal:** Journal of Emerging Technologies and Innovative Research

## DEVELOPMENT AND CHARACTERIZATION OF *TAMARINDUS INDICA*-PHOSPOLIPIDS COMPLEX AS AN EFFECTIVE PHYTOCONSTITUENTS DELIVERY SYSTEM BY Qbd APPROACH

Nalwar Yogesh S.<sup>1</sup> Gholwe S.B.<sup>1</sup>, Giram Padmaja S.<sup>2</sup>, Patil Arvind M.<sup>3</sup>, Gaikwad Abhimanyu<sup>1</sup>, Bhusnure Omprakash G.<sup>4\*</sup>,

<sup>1</sup>Toshniwal A.C.S. College, Dept. of Chemistry, Sengon, (MS), India.

<sup>2</sup>Channabasweshwar Pharmacy College, Dept of Pharmacology, Kava Road, Latur (MS), India.

<sup>3</sup>S.N.J.B's Arts, Commerce and Science College, Dept. of Chemistry, Chandwad, Dist Nashik, (MS), India

<sup>4</sup>Channabasweshwar Pharmacy College, Dept. of Pharmaceutical Quality Assurance, Kava Road, Latur (MS),

**Abstract :** The aim of the present study is to develop a complex of standardized *Tamarindus indica* (STI) and phospholipid with a goal to improve the bioavailability of its phytoconstituents. Tamarind is a flavonoid, glycoside that possesses different therapeutic activity. The poor solubility and dissolution rate limit its oral absorption and bioavailability. The phospholipid-STI complex was prepared using solvent evaporation method and characterized by various parameters like Solubility studies, Particle size determination, Infrared absorption (FTIR), Scanning electron microscopy (SEM), Entrapment efficiency etc. SEM reveal the reduction in crystallinity of extract in the complex. FTIR confirm the formation of phytophospholipid complex. The in vitro dissolution studies revealed a significantly higher efficiency of complex in releasing the STI in comparison to the pure STI, or the physical mixture. Phospholipid complex of STI may be of potential use in increasing the permeability and hence the bioavailability of tamarind. The result of the study revealed that the phospholipid complex may be considered as a promising drug delivery system that improves the absorption and bioavailability of plant constituents.

**Keywords:** Tamarindus Indica, Phospholipid Complex, Phytosomes, Qbd Approach.

### I. INTRODUCTION

*Tamarindus indica* is an important medicinal plant and is cultivated all over the world of the family Fabaceae. T. indica fruit extracts contains many active ingredients such as Lauric acids, palmitic acids, oleic acids, linoleic acids, alkaloid, flavonoid, tannins, saponins, glycosides and terpenoids. Tamarind flavonoids have a large spectrum of biological activity including antibacterial, antifungal, antimicrobial and antiviral. (1,2)

Tamarind is frequently used in popular medicine, and over the past two decades their potential therapeutic properties have been largely investigated by in vitro and in-vivo assays. Differential experimental studies support the beneficial effects of dietary tamarind against many diseases, such as cardiovascular, neurodegenerative pathologies, due to the high content of polyphenols. (3) Phytosomes are more bioavailable as compared to simple herbal extracts owing to their enhanced capacity to cross the lipid rich biomembranes and finally reaching the blood. The phytosomes technique has emerged as one of the leading methods of improving bioavailability of phyto-pharmaceuticals having poor competency of solubilising and crossing the biological membranes. (4)

Phytosome is a patented technology of India where plant polyphenolics are complexed with phospholipids to improve bioavailability. (5-10) Phospholipids are lipid molecules where glycerol is bonded to two fatty acids. Phospholipid mainly phosphatidylcholine are lipophilic substances and readily form complex with polyphenolic compounds. Phosphatidylcholine is a major structural constituent of all biological membranes. Phosphatidylcholine is a major component of soya phosphatidylcholine which provides free choline in the blood for the manufacture of acetylcholine; regulates digestive, cardiovascular and liver function. (11)

Tamarind shows low bioavailability because it is not soluble in water and is rapidly eliminated from the body. The aim of this study is to develop a tamarind loaded phospholipid complex that could have potential to increase the bioavailability. The key objective of the present study is to develop the phytosomes of tamarind, to increase the solubility and bioavailability of drug, to prepare the tamarind phytosomes by specific method. The complex (TD-PC) tamarind phytosomes thus prepared was evaluated physico-chemically for drug loading, Chemical interaction (FT-IR), Thermal analysis (DSC), Crystallinity (XRD), surface morphology (SEM), Solubility and Dissolution rate study. The developed complex may be suitable to reduce the dose and frequency and hence reduce toxic or side effect of tamarind.

### II. MATERIAL AND METHODS

#### Materials

Tamarind was purchased from Sunpharm Mumbai (India). Phosphatidylcholine was purchased from LIPIDOME LIFESCIENCES, Kheda (Gujarat). All other reagents and materials were of analytical grade.



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DTE Code :- 2253, University Code :- 947

**Title of the Paper:** Development and Validation of RP-HPLC Method for Estimation of Etoposide in Liposomes.

**Name of Author:** Dr. S.N. Nagoba

**Name of the Journal:** International Journal of Pharmaceutical Research

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**Article Detail**

**Development and Validation of RP-HPLC Method for Estimation of Etoposide in Liposomes**

**Author:** A.R.FUGATE, S.N.NAGOBA, S.R.HYAM

**ABSTRACT:** The incorporation of the excipients into a liposomal formulation aided in the achievement of targeted drug delivery. Various analytical techniques were used by the researchers to determine the amount of drug entrapped in the liposomes. The goal of this study was to create an RP-HPLC method for estimating etoposide concentrations in liposomes. As a mobile phase, methanol and water at pH 3.5 were used to create the process. The detection was carried out at a wavelength of 283 nm. It was discovered that the retention time was 2.491 minutes. The use of a short column with an id of 100 x 4.6 mm and a particle size of 3.0 μm helps to shorten analysis time. The lower flow rate and longer retention period result in a well-resolved peak. The linearity, accuracy, precision, robustness, LOD, and LOQ properties of this approach were all validated. At 50, 100, and 120 percent, the percent recovery was determined to be 100.88, 99.59, and 101.09, respectively. 0.9915 μg/ml and 0.9712 μg/ml were found to be the LOD and LOQ, respectively. The validation results and statistical data revealed that the procedure is straightforward, cost-effective, repeatable, and appropriate for active ingredient and dosage form quality analysis.

**Keyword:** Etoposide, Liposomes, Method development, RP-HPLC, Validation

**DOI:** <https://doi.org/10.31906/ijpr/2020-12-04-074>

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**Title of the Paper:** Formulation and Evaluation of Herbal Nanoparticles Prepared From Extracts of Antidiabetic Medicinal Plants.

**Name of Author:** Dr. S. N. Nagoba

**Name of the Journal:** International Journal of Pharmaceutical Research

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**Formulation And Evaluation Of Herbal Nanoparticles Prepared From Extracts Of Antidiabetic Medicinal Plants.**

**Author:** MOHOLKAR APARAJIT V, JADGE DHANRAJ R, NAGOBA SHIVAYE S N

**Abstract:** Herbal medicines have been widely utilized all over the world since ancient times, and physicians and patients alike have acknowledged their superior therapeutic value since they have fewer side effects than contemporary medications. To enhance patient compliance and minimize repeated administration, phytotherapeutics require a scientific way to administering the components in a continuous manner. Designing new drug delivery systems (NDDSs) for herbal components can help achieve this. NDDSs not only assist to overcome non-compliance by decreasing toxicity and improving bioavailability, but they also help to improve therapeutic value by reducing toxicity and increasing bioavailability. Nanotechnology is one such innovative method. Nanotechnology is a significant strategy to overcoming the numerous limits of various diseases, notably neurodegenerative disorders, and is one of the approaches that has affected human existence in diverse ways (MDs). Nanoparticles were made using *Gynostemma Silyvestre* leaf extract, *Banarasia thuronicia* leaf juice extract, and *Synalgin* tablet needs in this study. The produced nanoparticles were characterized utilizing several evaluation criteria after successful formulation.

**Keyword:** Nanoparticles, *Gynostemma Silyvestre*, *Banarasia thuronicia*, *Synalgin* tablet.

**DOI:** <https://doi.org/10.31838/IJPR2020.12.04.077>

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**Title of the Paper:** Formulation and Evaluation of Ketoprofen Loaded Nanosponges for Topical Drug Delivery.

**Name of Author:** Dr. S. N. Nagoba

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**Article Detail**

**Formulation and Evaluation of Ketoprofen Loaded Nanosponges for Topical Drug Delivery**

**Author:** KHADKUTKAR VIJAYAMANDA K, NAGOBA SHIVAPPA N, BAGWAN MOHORI, SHAKH NADHEER S

**Abstract:** Nanosponges are polymeric delivery systems composed of porous microspheres. They are dry sponge-like spherical Rheumatoid arthritis is a chronic, symmetrical, inflammatory autoimmune disease that initially affects small joints, progressing to larger joints, and eventually affecting the skin, eyes, heart, kidneys and lungs. Often, the bone and cartilage of joints are destroyed, and tendons and ligaments weaken. All this damage to the joints causes deformities and bone erosion that is very painful for a patient. The overall goals of first line treatment are to relieve pain and decrease inflammation. Medications considered as first-line drugs are non-steroidal anti-inflammatory drugs (NSAIDs) like ketoprofen. Ketoprofen is RCR class II drug (having poor solubility and high permeability) and it acts superficially so topical formulation can increase its efficacy. Hence, the objective of the present study was to formulate controlled release ketoprofen Nanosponges gel which alters the solubility and permeability of ketoprofen for increasing topical delivery. Ketoprofen was analysed for purity by UV analytical method. Nanosponges were prepared using various concentrations of Ethyl cellulose and PVA by emulsion solvent diffusion method. They were evaluated for percentage yield, percentage encapsulation efficiency, average particle size and polydispersity index, assay and in vitro permeation. PZ formulation was analysed by FTIR, drug content, in-vitro. FTIR results confirmed the absence of any drug polymer interaction. Optimized formulation was used to prepare gel formulation for topical application. Topical gels (G1, G2, and G3) were prepared by using different concentrations of carbopol and evaluated for pH, gel strength, assay, viscosity, spreadability and in vitro permeation. All formulations shows desirable pH and assay but G2 formulation was shows maximum viscosity, gel strength, spreadability and highest in vitro permeation. Stability study for optimized formulation was done for three months and evaluated for all parameters. All parameters were well within range, so formulations were found to be stable. All these results confirm that nanosponges is ideal for increasing the solubility and permeability of poorly water soluble drug like ketoprofen and gel is best option for dermal permeation of formulation.

**Keyword:** Ketoprofen, Nanosponges, topical gel, poor solubility, controlled release.

**DOI:** <https://doi.org/10.31838/ijpr/2020.12.03.027>

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**Title of the Paper:** Formulation and Evaluation of Liposomes Containing Sorafenib tosylate.

**Name of Author:** Dr. S. N. Nagoba

**Name of the Journal:** International Journal of Medicine and Pharmaceutical Science

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## FORMULATION AND EVALUATION OF LIPOSOMES CONTAINING SORAFENIB TOSYLATE

NAGOBA SHIVAPPA N<sup>1</sup>, SHIMGE KRISHNA R<sup>2</sup> & DESHMUKH ADITYA Y<sup>3</sup>

<sup>1</sup>Professor and Head, Department of Pharmaceutics, Channabasweshwar Pharmacy College,

Kava Road, Latur, Maharashtra, India

<sup>2,3</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India

### ABSTRACT

The aim of the present study is to encapsulate Sorafenib tosylate in liposomal formulation for the effective treatment of hepatocellular carcinoma. Many conventional dosage forms of Sorafenib tosylate are available in market with high drug dose owing to high permeability and low solubility. But the large drug doses are coupled with a number of toxicities. To overcome such problems, the liposomal inclusions of Sorafenib tosylate have approached with the objective of increasing its bioavailability with small drug dose and better tumor targeting by making as a nano-sized formulation. The compatibility study of drug with phospholipids & other excipient have checked using the FTIR technique. In the present study, Sorafenib tosylate liposomes have prepared by thin film hydration technique using soyalecithin as lipid coat, cholesterol as rigidator, tween 80 and organic solvent like chloroform and methanol with hydrating media phosphate buffer (pH 7.4). Six formulations of liposomes have formulated, characterized and evaluated by particle size of vesicles, zeta potential, surface morphology, entrapment efficiency, *in vitro* drug release and stability studies. The optimized formulation containing drug, lipid and cholesterol ratio 1:8:3 respectively, showed highest entrapment efficiency (55.62%). The optimized formulation has exhibited 83.36 % drug release within 24 hours. The stability study as per ICH guidelines at different temperatures conducted has showed maximum liposomal drug retention at refrigerated temperature 4°C as compared to room temperature and accelerated stability study. The results suggest that the liposome encapsulation can increase the bioavailability of highly potent poorly bioavailable Sorafenib tosylate and can be used as a useful targeted drug delivery system for an effective management of hepatocellular carcinoma.

**KEY WORDS:** Sorafenib Tosylate, Film Hydration Method, Soya Lecithin, Cholesterol, *In-Vitro* Drug Release & Stability Studies

**Received:** Jan 17, 2019; **Accepted:** Feb 07, 2019; **Published:** Mar 16, 2020; **Paper Id.:** LIMPSAPR20205

### INTRODUCTION

The term Liposomes were first coined by Bangham in 1965, the name liposome was made of two Greek words first "lipos" means fat and "somas" means body. Liposomes are microscopic vesicles composed of one or more lipid bilayers which have the spherical shape and size of liposome ranging from 20 to 1000 nm. Drug molecules can either be encapsulated in the aqueous space or entrapped into the lipid bilayers. The exact location of a drug in the liposome will depend upon its physicochemical characteristics and the composition of the lipids [1, 2, 3, and 4].

Liposomes are colloidal dispersion formed as concentric biomolecular lipid vesicles that are capable of encapsulating drugs. These lipid vesicles are usually of phospholipids with or without some additives. Cholesterol has to be added to improve bilayer characteristics of liposomal cells like membrane rigidity of the artificial vesicles [5, 6, 7, 8].

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**Title of the Paper:** Insilico analysis of marine indole alkaloids for design of adenosine A2A receptor antagonist**Name of Author:** Dr. O. G. Bhusnure**Name of Journal:** Journal Of Biomolecular Structure And Dynamics**Insilico analysis of marine indole alkaloids for design of adenosine A2A receptor antagonist**Nitin Lonikar<sup>a,b</sup>, Prafulla Choudhari<sup>c</sup> and Omprakash Bhusnure<sup>a</sup><sup>a</sup>Channabasweshwar Pharmacy College(Degree), Latur, India; <sup>b</sup>Department of Pharmaceutical Chemistry, Shivlingeshwar College of Pharmacy, Almala, India; <sup>c</sup>Department of Pharmaceutical Chemistry, Bharati Vidyapeeth College of Pharmacy, Kolhapur, India

Communicated by Ramaswamy H. Sarma

**ABSTRACT**

Neurological disease is the disease associated with most of geriatric population in the world. The diseases like Alzheimer's disease and Parkinson's disease are associated with the change in the life style in current era. Treatment of these diseases normally focused on the agents which can able to manipulate the neurotransmitter release, so it is associated with severe side effects. Adenosine receptors are the upcoming targets for the inflammatory as well as neurological diseases as agents like istradefylline are in the clinical use. Marine natural products are the rich source of the valuable drug like substances, number marine alkaloids are known for their ability to pass blood brain barrier (BBB) which is major hurdle in the neurological drug discovery. Here, we report the virtual screening of some marine alkaloids for adenosine 2 receptor binding potential. Results indicated tospentin C, 6'-de bromohamactan thin, 6-hydroxydiscodermindole and discodermindole are having excellent binding affinity towards the adenosine 2A receptor than other selected alkaloids.

**ARTICLE HISTORY**Received 13 April 2020  
Accepted 5 May 2020**KEYWORDS**Neurological disease;  
adenosine 2A receptor;  
virtual screening; alkaloids;  
pharmacophore**1. Introduction**

Neurological diseases are the one of the most prominent challenges that medicinal fraternity is currently facing. Due to the overall change in the life style and working stress the quanta of people who are the sufferers of these neurological diseases is continuously increasing. Parkinson's disease (PD) and Alzheimer's disease (AD) are two prominently observed neurological diseases (Phani Kumar et al., 2015). PD is a known chronic disease which is commonly observed geriatric population which are over 65 years of age. Some recent findings are suggesting that this geriatric disease is now can affects the population form 40 years of age, PD is characterized by the loss of the dopamine (DA) producing neurons gradually which will be reflecting in the partial or complete loss of impairment in motor function of the brain which can be associated with the mood instability. Most of the symptoms which are associated with the PD are tremor and muscular rigidity (Lmamzadeh & Surguchov, 2018). Parkinson treatment normally divided in to two approaches like dopamergic and non-dopamergic approach. Dopamergic approach is involves the treatment involving utilization of L DOPA a well-known precursor of the dopamine (Jacobson & Gao, 2006; Morelli & Wardas, 2001; Shook & Jackson, 2011). Non-dopamergic includes use of the COMT inhibitors and MAO B inhibitors which controls the utilization of the dopamine. The dopamergic approach is most significant approach for Parkinson's treatment but it is associated with the side effects dyskinesia, on off effects and hallucinations, and these may become more severe with the long-term utilization.

The other disadvantage of this dopamergic approach as it does address the other issues like mood instability and cognitive disturbances. Adenosine is an important neuromodulator which acts as a coordinators for the number of neurotransmitters in the brain which are accounting various important functions of brain motor function and mood. In human four different types of adenosine receptors are normally presents like A1, A2A, A2B, and A3 which are G-protein-coupled receptors. A1 and A3 receptors are accounts for the inhibitory G proteins, while A2A and A2B receptors accounts for stimulatory G proteins. Adenosine receptors A2A also plays role in the inflammation process via action of adenosine with production of TNF- $\alpha$ , macrophage inflammatory protein (MIP)-1 $\alpha$ , MIP-1 $\beta$ , MIP-2 $\alpha$  and MIP-3 $\alpha$ . Adenosine and dopamine D2 receptors exactly opposite effects on the adenylate cyclase and cAMP production which leads to inhibition of these A2 receptors may leads to the enhancement of dopamine D2 receptor signalling (Jacobson & Gao, 2006; Morelli & Wardas, 2001; Shook & Jackson, 2011). Development of agents like istradefylline is found to be to be effective in the patient which are treated with levodopa/carbidopa combination, via minimization of the off episodes. For this reason the inhibition or antagonism of the adenosine A2A receptor has become an attractive strategy for the development of non dopamine based treatments for the PD (Franco & Navarro, 2018; Kochanowska-Karamyian & Hamann, 2010; Müller & Jacobson, 2011). Marine indole alkaloids are a large and steadily growing group having very diverse biological potentials like anticancer, antidepressant, anti-infective which enables these

CONTACT Nitin Lonikar [nlonikar@cdphl.org](mailto:nlonikar@cdphl.org) Department of Pharmaceutical Chemistry, Shivlingeshwar College of Pharmacy, Almala, India Supplemental data for this article can be accessed online at <https://doi.org/10.1080/07391102.2020.1765874>.

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**Title of the Paper:** Formulation and Evaluation of Nanosponges Hydrogel for Topical Drug Delivery Containing Griseofulvin.

**Name of Author:** Dr. Nagoba S.N

**Name of the Journal:** International Journal of Medicine and Pharmaceutical Sciences

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## FORMULATION AND EVALUATION OF NANOSPONGES HYDROGEL FOR TOPICAL DRUG DELIVERY CONTAINING GRISEOFULVIN

BHALEKAR ROHINI V<sup>1</sup>, NAGOBA SHIVAPPA N<sup>2</sup>,  
SHAIKH NASHEER S<sup>3</sup> & SWAMI AVINASIL. B<sup>4</sup>

<sup>1,2,4</sup>Research Scholars, Department of Pharmaceutics, Channabasweshwar Pharmacy College, Kava Road,  
Latur, Maharashtra, India

<sup>3</sup>Professor and Head, Department of Pharmaceutics, Channabasweshwar Pharmacy College, Kava Road,  
Latur, Maharashtra, India

### ABSTRACT

The objective of the present study was to formulate Griseofulvin nanosponges hydrogel for topical delivery to treat topical fungal infection. Conventional dosage forms of Griseofulvin are available, but they show variation in bioavailability and they are associated with a number of toxicities when administered orally. To overcome these problems, the inclusion of Griseofulvin in topical gel formulation was approached with the aim of increasing permeability at the site of action which leads to improvement in bioavailability. The compatibility study of drug polymers and excipients was checked by FTIR studies. The Six formulations of nanosponges are formulated successfully using ethyl cellulose polymer and PVA as surfactant by using emulsion solvent diffusion method. The obtained nanosponges have been evaluated for particle size, zeta potential, XRD, surface morphology, entrapment efficiency, in-vitro drug release and stability studies. The scanning electron microscopy of nanosponges showed that Nanosponges are spherical in shape. Entrapment efficiency and in-vitro diffusion of optimized F5 formulation was found to be 73% to 93% respectively. The prepared nanosponges were formulated to hydrogels by simple dispersion method using carbopol 934 as a gelling agent and propylene glycol as permeation enhancer. Formulated hydrogel are evaluated for visual appearance, pH, spreadability, assay, and in vitro permeation. The evaluation results of Griseofulvin loaded nanosponges hydrogel show that G2 formulation increasing the solubility and permeability of poorly water soluble drug i.e., Griseofulvin.

**KEYWORDS:** Griseofulvin, Nanosponges, Hydrogel, Emulsion Solvent Diffusion Method & Zeta Potential

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### 1. INTRODUCTION

Targeted drug delivery system has been the major problem of medical researcher is, "how to target them to the right place in the body?" and "how to manage the release of the drug?" to prevent overdose. The developments of new molecule like Nanosponges have the potential to solve these problems. Nanosponges are small sponges – like porous particular structure in which a large variety of substances can be encapsulated or suspended, and then be included into a dosage form. They have a spherical colloidal character; have a very high solubilization capability for poorly soluble drugs by their inclusion and non-inclusion behavior. Nanosponges have recently been developed and useful for drug delivery. Nanosponges can solubilize into poorly water soluble drug not only provide prolonged release but also improved drug bioavailability. Nanosponges are able to load both hydrophilic and hydrophobic drug molecules because of their inner hydrophobic cavities and external hydrophilic branching, thereby offering breathtaking flexibility. Nanosponges are either like a 3D network or scaffold which consist of the backbone is

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E ISSN	2519-9889
P ISSN	-
Country	Iraq
Impact Factor	Awaiting
Publication year	2015
Publisher Name	Ar-Rahman Publications
Frequency	Monthly
Indexed	Yes
Website	www.ijpsm.com

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**Title of the Paper:** Validated RP-HPLC method for estimation for estimation of Apixaban in bulk and pharmaceutical dosage form.

**Name of Author:** Dr. O. G. Bhusnure

**Name of the Journal:** Journal of Emerging Technologies and Innovative Research.

## VALIDATED RP-HPLC METHOD FOR ESTIMATION OF APIXABAN IN BULK AND PHARMACEUTICAL DOSAGE FORMS

Nalwar Yogesh S.<sup>1</sup>, Imran Mujewar N.<sup>1</sup>, Gholve S.B.<sup>1</sup>, Giram Padmaja S.<sup>2</sup>, Patil Arvind M.<sup>3</sup>, Bhusnure Omprakash G.<sup>4\*</sup>

<sup>1</sup>Toshniwal A.C.S. College, Dept. of Chemistry, Sengaon, (MS), India

<sup>2</sup>Channabasweshwar Pharmacy College, Dept of Pharmacology, Kava Road, Latur (MS), India.

<sup>3</sup>S.N.J.B's Arts, Commerce and Science College, Dept. of Chemistry, Chandwad, Dist Nashik, (MS), India.

<sup>4</sup>Channabasweshwar Pharmacy College, Dept. of Pharmaceutical Quality Assurance, Kava Road, Latur (MS), India.

**Abstract :** The methods having requisite precision, accuracy, specificity and robustness were developed and validated for quantitative determination of Apixaban in pharmaceutical dosage forms. The chromatographic column used was a reverse phase 250  $\mu$  4.6 mm, 5  $\mu$ m (particles) packing Inertsil<sup>®</sup> ODS-3V C<sub>18</sub> HPLC column. The column and the HPLC system were kept at ambient conditions. The mobile phase was 0.02 M phosphate buffer pH 5.5 Acetonitrile (20:80 v/v) delivered at a flow rate of 0.8 ml/min. The injection volume was 20  $\mu$ l. The elute was analyzed by HPLC system in which UV detector was set at 279 nm. The response was linear range of 5.30  $\mu$ g/ml (R<sup>2</sup> = 0.997). Validation of method was carried out fulfilling ICH guidelines. The methods were applied without any interference from excipients, for determination of drug in coated tablets. It is suggested that the proposed HPLC chromatographic method could be used routine quality control and dosage form assay of Apixaban.

**Keywords:** RP-HPLC, Apixaban, Method development & Validation, Stability Study.

### I. INTRODUCTION

Apixaban is an anticoagulant for the treatment of venous thromboembolic events. Chemically is an 1-(4-methoxyphenyl)-7-oxo-6-[4-(2-oxopiperidin-1-yl)phenyl]-4,5-dihydropyrazolo[3,4-c]pyridine-3-carboxamide. (Figure 1).

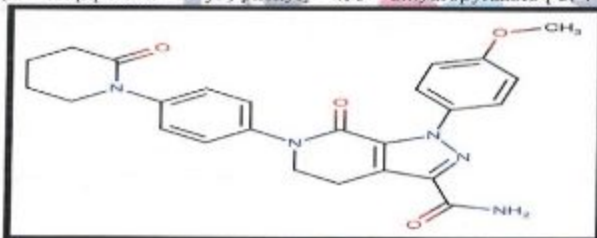


Figure 1: Structure of Apixaban

Its molecular formula is C<sub>25</sub>H<sub>25</sub>N<sub>5</sub>O<sub>4</sub>, and a molecular weight is 459.5. Apixaban is a white to pale-yellow powder and it is stored between 20 °C to 25 °C temperature. At physiological pH (1.2-6.8), apixaban does not ionize; its aqueous solubility across the physiological pH range is ~0.04 mg/ml. Apixaban dosage form is tablets (ELIQUIS) and they are available for oral administration in strengths of 2.5 mg and 5 mg of apixaban. Apixaban has been available in Europe since may 2012. The medical use of apixaban is to lower the risk of stroke and embolism in patients with nonvalvular atrial fibrillation. Apixaban is highly selective, orally bioavailable, and reversible direct inhibitor of free and clot-bound factor Xa. There are some methods of estimation of apixaban from human plasma by LC-MS3-9, but there is no assay method for apixaban by HPLC and UV Spectrophotometry. Further, apixaban is not officially reported in any pharmacopeia (USP, EP, JP & IP). The current HPLC method were developed and validated as per the ICH guidelines. The RP-HPLC method described here is simple, sensitive, and reproducible for apixaban determination in formulation with low background interferences. An attempt has been made to develop and validate to ensure their accuracy, precision and other analytical method validation parameters as mentioned in the below.<sup>1</sup>

### II. Material Method:-

#### Chromatographic conditions

The chromatographic column used was a reverse phase 250  $\mu$  4.6 mm, 5  $\mu$ m (particles) packing Inertsil<sup>®</sup> ODS-3V C<sub>18</sub> HPLC column. The column and the HPLC system were kept at ambient conditions. The mobile phase was 0.02 M phosphate buffer pH 5.5 Acetonitrile (20:80 v/v) delivered at a flow rate of 0.8 ml/min. The injection volume was 20  $\mu$ l. The elute was analyzed by HPLC system in which UV detector was set at 279 nm.

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**Title of the Paper:** Development and validation of RP-HPLC method for determination of Finasteride in pharmaceutical dosage form.

**Name of Author:** Dr. O. G. Bhusnure

**Name of Journal:** World Journal of pharmaceutical research



**DEVELOPMENT AND VALIDATION OF A RP- HPLC METHOD FOR DETERMINATION OF FINASTERIDE IN PHARMACEUTICAL DOSAGE FORMS**

**<sup>1</sup>\*Shraddha T. Nemane, <sup>1</sup>Sachin B. Gholve, <sup>1</sup>Omprakash G. Bhusnure, <sup>1</sup>Shantanu R. Mane, <sup>1</sup>Pranita P. Surwase and <sup>2</sup>Pawan N. Karwa**

<sup>1</sup>Department of Quality Assurance, Channabasweshwar Pharmacy College, Latur - 413512, Maharashtra, India.

<sup>2</sup>Gurukrupa Institute of Pharmacy, Majalgaon-431131, Maharashtra, India.

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**\*Corresponding Author**  
**Shraddha T. Nemane**  
Department of Quality Assurance,  
Channabasweshwar Pharmacy College, Latur - 413512, Maharashtra, India.

**ABSTRACT**

To develop a simple, cheap, accurate, precise, linear and rapid Reverse Phase High Performance Liquid Chromatographic (RP-HPLC) method and validate as per ICH & USP guidelines for the quantitative estimation of Finasteride in pharmaceutical dosage forms. The separation was conducted by using mobile phase consisting of acetonitrile:water in the ratio (60:40). The wavelength was found at 245nm. Chromatographic determination was performed on Agilent 1220 Infinity LC with ezechrome software with variable wavelength detector. The separation was conducted at the flow rate of 1.10 ml/min using variable wavelength detector. The developed method resulted in finasteride eluting at 3.71min. The method was found to be linear over

the concentration range 2-12 $\mu$ g/ml with coefficient regression R<sup>2</sup> -0.9994. The precision is exemplified by relative standard deviation of 1.15 to 1.8%. Percentage Mean recovery was found to be in the range of 97 to 99%, during accuracy studies. The limit of detection (LOD) and limit of quantitation (LOQ) was found to be 1.783ng/ml and 5.40 ng/ml respectively. A cheap, accurate, precise, linear and rapid RP-HPLC method was developed and validated for the quantitative estimation of finasteride tablets as per ICH guidelines and hence it can be used for the routine analysis in various pharmaceutical industries.

**KEYWORDS:** RP-HPLC, Finasteride, Method Validation.

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**Title of the Paper:** Quality by Design Based Approach for the Estimation of Telmisartan in Presence of Related Substances by RP-HPLC Method.

**Name of Author:** Dr. S. B. Gholve

**Name of the Journal:** International Journal of Pharmaceutical Research

ISSN 0975-2366

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**Research Article**

## Quality by Design Based Approach for the Estimation of Telmisartan in Presence of Related Substances by RP-HPLC Method

SACHIN GHOLVE<sup>1\*</sup>, MOHAMMAD IMRAN ANEES<sup>1</sup>, MARIA SAIFEE<sup>1</sup>, JAIPRAKASH SANGSHETTI<sup>1</sup>, OMPRAKASH BHUSNURE<sup>2</sup>, ABUBAKAR SALAM BAWAZIR<sup>1</sup>

<sup>1</sup>Y. B. Chavan College of Pharmacy, Dr. Rafiq Zakaria Campus, Rauza Baugh, Aurangabad, Maharashtra, India - 431001

<sup>2</sup>Channabasweshwar Pharmacy College (Degree), Kava Road, Latur, Maharashtra, India-413512

\*Corresponding Author

Email: sbgholve@gmail.com

Received: 15.10.20, Revised: 09.11.20, Accepted: 03.12.20

**ABSTRACT:**

A rapid specific RP-HPLC method has been developed for the determination of telmisartan in presence of impurity in the pharmaceutical drug substances. The control of pharmaceutical impurities is currently a critical issue in the pharmaceutical industry. The International Council for Harmonization (ICH) has formulated a workable guideline regarding the control of impurities. The objective of the recent study was to develop and validate a HPLC method for the quantitative determination of process-related impurities of telmisartan in pharmaceutical drug substances. Telmisartan is an angiotensin II receptor antagonist used in the management of hypertension. Chromatographic identification of the impurities was carried out on Eclipse XDB Phenyl (250×4.6 mm) column is used for the development of the method. The mobile phase consists of buffer and acetonitrile. The flow rate of the mobile phase was 1.0 mL/min with gradient elution. The column temperature is 30°C ± 2°C and the detection wavelength is 296 nm. The injection volume is 10 µL. The method was validated for linearity in the range of 2-12 µg/ml concentration and the LOD & LOQ values obtained were 0.00005123 and 0.0001341 µg/ml respectively which specifies the method's sensitivity. The proposed method was successfully used to estimate the telmisartan in presence of related substances.

**Keywords:** Telmisartan, RP-HPLC, Impurities, linearity, validation, ICH Guidelines.

**INTRODUCTION**

Telmisartan, 4'-[[[1,4'-dimethyl-2'-propyl[2,6'-bi-1H-benzimidazol-1'-yl)methyl](-1,1'-biphenyl)-2-carboxylic acid is an angiotensin II receptor antagonist used in the management of hypertension. Generally, angiotensin II receptor blockers such as Telmisartan bind to the angiotensin II type 1 (AT1) receptors with high affinity, causing inhibition of the action of angiotensin II on vascular smooth muscle, ultimately leading to a reduction in arterial blood pressure<sup>1</sup>. Several analytical methods have been reported in the literature for the determination of Telmisartan and its impurities. Pharmaceutical impurities are the unwanted chemicals that co-exist with the active pharmaceutical ingredient (API) or they may develop during formulation, or upon aging of both API and formulated APIs to medicines. The presence of these impurities even in minor amounts can influence the efficacy and safety of drugs<sup>2,3</sup>. There are various types of sources of impurities that are collected by

products. That is i) synthesis related impurity, ii) organic impurity and, iii) inorganic impurity<sup>4</sup>. There is an ever-increasing interest in impurities present in API<sup>5</sup>. The International Council for Harmonization (ICH) of technical requirements for registration of pharmaceuticals for human use ICH has also published guidelines for validation of methods for analyzing impurities in new drug substances, products, residual solvents, and microbiological impurities<sup>6</sup>. In the overwhelming majority of the pharmacopoeial monographs, impurities in the active pharmaceutical ingredient are determined by selective (usually high-performance liquid chromatography (HPLC)) or non-selective (usually titrimetric or ultraviolet (UV) spectrophotometry) methods<sup>7</sup>. HPLC is the most accurate method widely used for the qualitative and quantitative analysis of drug products<sup>8</sup>. Analytical method development and validation play important roles in drug discovery, drug development, and the manufacture of pharmaceuticals. It involves the detection of the





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**Title of the Paper:** Design, Synthesis and Antibacterial Studies of Some New Pyridopyrimidine Derivatives as Biotin Carboxylase Inhibitors

**Name of Author:** Mr. V. B. Panchabhai

**Name of the Journal:** Bulletin of Faculty of Pharmacy, Cairo University

### Design, Synthesis and Antibacterial Studies of Some New Pyridopyrimidine Derivatives as Biotin Carboxylase Inhibitors

Original Article

Vivek B. Panchabhai, Parag G. Ingole, S. R. Butle

School of Pharmacy, Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra, India.

#### ABSTRACT

Present study reports the development of novel pyridopyrimidine derivatives as biotin carboxylase inhibitors with potent antibacterial activity. These compounds were designed to avoid possibility of resistance development. Accordingly eighteen compounds were synthesised and characterized on the basis of spectral data. These compounds were tested for their antibacterial potential by the enzyme kinetic assay against the biotin carboxylase. The minimum inhibitory concentration (MIC) and single step resistance studies were also performed. Compound 2-((2-Phenylpyrido[2,3-d]pyrimidin-4-yl)amino)phenol (6o) showed promising activity in biotin carboxylase inhibition with low MIC. It showed molecular docking score of -7.96, this compound showed formation of hydrogen bonds with the active site residues and van Der Waals interactions. The MIC of compounds under investigation was in the range of 2-5µg/mL over most of the strains studied. It also showed the mutant selection windows of around five which is better than the reference compound rifampin. This compound 6o can be studied further and developed into a potential antibacterial lead molecule.

**Key Words:** Biotin carboxylase, drug resistance, molecular docking, pyridopyrimidine.

**Received:** 02 March 2019, **Accepted:** 30 June 2019

**Corresponding Author:** Vivek B. Panchabhai, School of Pharmacy, Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra, India, **Tel.:** +919423714528, **E-mail:** vivekpanchabhai82@gmail.com

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#### INTRODUCTION

In 2014, the World Health Organization (WHO) released an alarming report on microbial resistance to antibiotics especially in bacteria. The WHO report show a comprehensive picture of data obtained from 114 countries.<sup>[1]</sup> According to it at least seven different common bacteria cause serious diseases like postoperative infections, blood stream infections, hospital acquired infections and gonorrhoea have become drug resistant. Lot of information regarding the spread of drug resistant microorganisms are available still a big gap is observed in tracking antibiotic resistance. United States alone reported over two million deaths due to bacterial infection and 23,000 deaths due to drug resistant bacterial strains.<sup>[2]</sup> One of the major reasons for rise of drug resistance is lack of new group of antibiotics. The penicillin was discovered during late 1920s, followed by cephalosporin in late 1940s. After a gap of two decades carbapenams and fluoroquinolones were discovered in the 80s. However, since then no such breakthrough discovery has been reported.<sup>[3]</sup> It is known that about 30-40 targets are generally harnessed for drug discovery process against the bacteria, thus there is an urgent need for smart molecules that target novel targets or multiple targets.<sup>[4]</sup>

The development of techniques like virtual screening, pharmacophore generation, and fragment based drug discovery, advances in drug delivery has resulted in discovery of newer compounds and validation of newer targets and their proper administration to patients.<sup>[5-9]</sup> One of the major metabolic pathways found in bacteria is the fatty acid synthesis pathway and has become a popular target among medicinal chemist. In a recent development, the enzyme biotin carboxylase (BC) was found to be a very attractive target for inhibiting the Acetyl CoA carboxylase mediated reaction. BC plays a vital role in Acetyl CoA carboxylase (ACC) catalysed reactions. Biotin carboxylases catalyse the carboxylation of biotin carboxyl carrier protein (BCCP)-biotin in the presence of bicarbonate to form the BCCP-biotin-CO<sub>2</sub>. In the next step, BCCP-biotin-CO<sub>2</sub> transfer the carboxyl group to Acetyl-CoA and forms malonyl-CoA in presence of carboxyltransferase (CT) (Figure 1).<sup>[7]</sup> The heterocyclic moieties like the pyridopyrimidines such as i to iv were reported to possess significant BC inhibitory activity (Figure 2).<sup>[8]</sup> Mochalkin *et al.* showed that this class of compounds bind to the ATP binding site of bacterial BC did not bind or inhibit the human BC.<sup>[9]</sup> Several recent reports on the development of BC inhibitors have validated it as a potential drug target for the development of novel antibacterial compounds.



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**Title of the Paper:** Development and validation of a RP-UPLC Method for Determination of Linezolid in Pharmaceutical formulation

**Name of Author:** Dr. O. G. Bhusnure

**Name of the Journal:** Journal of Drug Delivery and Therapeutics

Bhusnure et al

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Research Article

**Development and Validation of a RP-UPLC Method for Determination of Linezolid in Pharmaceutical Formulation**Bhusnure Omprakash G.<sup>1\*</sup>, Suryawanshi Shivr<sup>2</sup>, Vijayendra Swamy S.M.<sup>3</sup>, Gholve Sachin B.<sup>4</sup>, Girm padmaja S.<sup>2</sup>, Birajdar Mahesh J.<sup>4</sup>

1.Channabasweshwar pharmacy Collage, Dept of Quality Assurance, Latur (MS), India.

2.Channabasweshwar pharmacy Collage, Dept of Pharmacology, Latur (MS), India.

3.Channabasweshwar pharmacy Collage, Dept of Pharmaceutics, Latur (MS), India.

4.Channabasweshwar pharmacy Collage, Dept of Pharmaceutical chemistry, Latur (MS), India.

**ABSTRACT**

A simple, sensitive and accurate RP-UPLC method has been developed for the determination of Linezolid in Tablet formulation. The mix of the Linezolid was found to be 251nm in Acetonitrile: Buffer [40:60(v/v)] The method shows high sensitivity with linearity 5 to 30µg/ml (regression  $r^2 = 0.999$ ). This method was tested and validated for various parameters according to ICH guidelines and USP. The Detection limit and quantitation limit were found to be 50ng ml<sup>-1</sup> and 150 ng ml<sup>-1</sup> in Acetonitrile: Buffer [40:60(v/v)] respectively. The results demonstrated that the procedure is accurate, precise and reproducible (relative standard deviation < 2%), while being simple, cheap and less time consuming and can be suitably applied for the estimation of Linezolid in Tablet pharmaceutical formulation.

**Keywords:** linezolid, Acetonitrile: Buffer 40:60 (v/v), RP-UPLC, Methanol.

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**\*Address for Correspondence:**

Bhusnure Omprakash G, Channabasweshwar pharmacy Collage, Dept of Quality Assurance, Latur (MS), India.

**INTRODUCTION**

Analytical chemistry is a scientific discipline that develops methods, instruments and strategies to obtain information on the composition and nature of matter. Analytical chemistry is concerned with the chemical characterization of matter and thus pharmaceutical analysis covers matter having pharmaceutical applications. Knowledge of chemical composition of many substances is important in our daily life. Analytical chemistry plays an important role in nearly all aspects of chemistry viz. agricultural, clinical, environmental, forensic, manufacturing, metallurgical, and pharmaceutical chemistry.

UPLC refers to Ultra Performance Liquid Chromatography. It improves in three areas: chromatographic resolution, speed and sensitivity analysis. It uses fine particles and saves time and reduces solvent consumption. The UPLC is based on the principle of use of stationary phase consisting of particles less than 2 µm (while HPLC columns are typically filled with particles of 3 to 5 µm). The underlying principles of this

evolution are governed by the van Demeter equation, which is an empirical formula that describes the relationship between linear velocity (flow rate) and plate height (HETP or column efficiency) 14. The Van Demeter curve governed by an equation with three components shows that the usable flow range for a good efficiency with small diameter particles is much greater than for larger diameters The advent of UPLC has demanded the development of a new instrumental system for liquid chromatography, which can take advantage of the separation performance (by reducing dead volume) and consistent with the pressures (about 8000 to 15,000 PSI, compared with 2500 to 5000 PSI in HPLC). Efficiency is proportional to column length and inversely proportional to the particle size 18. Therefore, the column can be shortened by the same factor as the particle size without loss of resolution. The application of UPLC resulted in the detection of additional drug metabolites, superior separation and improved spectral quality.

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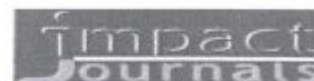


**Title of the Paper-** Formulate and Evaluate of Herbal Gel Containing Pomegranate Fruit Extract

**Name of Author-** Dr. S.N. Nagoba

**Name of the Journal-** International Journal of Research in Humanities, Arts and Literature

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## FORMULATE AND EVALUATE OF HERBAL GEL CONTAINING POMEGRANATE FRUITE EXTRACT

Karbhari Vilas N<sup>1</sup>, Shinde Nishiganda G<sup>2</sup> & Nagoba Shivappa N<sup>1</sup>

<sup>1</sup>Research Scholar, Maharashtra Poly (D.Pharm) Institute Nilanga, Latur, Maharashtra, India

<sup>2,3</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India

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### ABSTRACT

*Inflammation or phlogosis is a pathophysiological response of living tissues to injuries that leads to the local accumulation of plasmatic fluid and blood cells. Although it is a defense mechanism, the complex events and mediators involved the inflammatory reaction can induce, maintain or aggravate many diseases. Therefore, the uses of anti-inflammatory agents are helpful in the therapeutic treatment of these pathologic.*

*The concept of anti-inflammatory is changing day to day. The medicinal plants Punica granatum are richest source for management of the anti-inflammatory. Family Lythraceae used as hemostatic and anti-inflammatory. The aim of present study is to formulate and evaluate the herbal gel containing pomegranate fruit extract. The pomegranate fruit extract is shows the anticancer activity, analgesic and anti-inflammatory activity, Antiepileptic activity, Antidiabetic, hypolipidaemic and antioxidant activity. Prevention of skin damage, Cardio protective, Musculoskeletal. The gel formulation was designed by using Carbopol 940, pomegranate fruit extract propylene glycol, methyl paraben, Propyl paraben and required amount of distilled water. The skin pH was maintained by drop wise addition of Tri-ethanolamine. The prepared gel was characterized for their physicochemical parameters, preliminary Phytochemical analysis, appearance, quantitative analysis, Spread ability, pH, viscosity and extrudability, stability study.*

**KEYWORDS:** Pomegranate Fruit, Carbopol 940, Anti-Inflammatory, Gel Formulation etc



  
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Name of Author- Dr. S. N. Nagoba

Name of the Journal- International Journal of Bio-Pharma Research

ISSN: 2287-6898

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**Open Access****Research Article****Formulation and evaluation of *Boswellia serrata* resin gel by using different gelling agents**

Gaware Rutuja J., Gaikwad V. M., Nagoba Shivappa N.\*, Hindole S. S.  
Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

**Abstract:** The main objective of the present research work was to develop herbal gel of *Boswellia serrata* (Shallaki gum) for Antiarthritic activity to achieve greater therapeutic effect. Rheumatoid arthritis is a chronic, metabolic disorder which affects joints and periarticular tissue. The plant *Shallaki* is the best traditional medicine for the treatment of rheumatoid arthritis. The motive of this work is to formulate an effective formulation for the treatment of rheumatoid arthritis without any side effect as seen in synthetic drugs because the use of synthetic NSAID'S creates problem-related to the gastrointestinal tract which may further complicate the situation. Hence there is a need to use in Herbal formulation, *Shallaki* is very effective in osteoarthritis, juvenile in rheumatoid arthritis, soft tissue fibrolite, and spondylitis without any side effect. The *Boswellia serrata* (Shallaki) resin gel by using a different gelling agent like Carbopol, HPMC K1M, and Pluronic F127 gives a better therapeutic result. All the formulations (F1 to F8) were subjected for evaluations like physical appearance; pH was found to be 6.09%, in-vitro drug release study was found to be 90.66% at 8 hrs, viscosity was found to be 66800cp, spreadability was found to be 22.12gm/sec. FTIR results showed no interaction between drug and polymers. *Boswellia serrata* is one specific Ayurvedic remedy that was proceeded to extract the gum resin for the treatment of rheumatoid arthritis. The benefits of *Boswellia* are relatively well explained the locus mostly to reduce the inflammation or pain caused due to rheumatoid arthritis. Formulation (F5) shows the best result of drug release 90.66% at 8 hrs which containing 0.2% Carbopol and 4% Pluronic F127 as a gelling agent.

**Key words:** *Boswellia serrata*; Shallaki; Gelling agents; Traditional; Rheumatoid arthritis; Herbal gel.

**Introduction**

The oleo-gum resin of *Boswellia serrata* Family Burseraceae, a tree commonly found in India is used for its patent Antiarthritic and anti-inflammatory activity<sup>[1]</sup> and has been mentioned in the ancient ayurvedic text i.e. Sushruta Samhita<sup>[2]</sup> and *Charak Samhita* the gum contains triterpenic acid  $\beta$ -boswellic acid<sup>[3]</sup> as the principle constituent which is responsible for its anti-inflammatory activity<sup>[4]</sup>.

Currently there is a greater global interests in non synthetic natural drug derived from plant herbal sources due to better tolerance and decreased adverse drug reaction<sup>[5]</sup>. However, there is a lack of supporting studies regarding the formulation and evaluation aspect. A document on quality control for medicinal plant material by the WHO<sup>[6]</sup> and the note for guidance on specifications, by the committee for proprietary medicinal product (CPMP)<sup>[7]</sup> are positive measured in this direction thus the present study was carried out to formulate gel of *Boswellia serrata* extract using different

gelling agent in varying and to evaluate its physical parameters and to set up specifications for the finished medicinal product.

The resin is obtained by making scrapes in the trunk of the various *Boswellia species* (Burseraceae), and collecting the dried resin gums from the trees later.<sup>[8,9]</sup> Good quality resin is produced only for 3 years, after which the quality of the collected resin decreases significantly; therefore, the tree should be left to rest for some years after the harvesting period.<sup>[10]</sup> *B. serrata* has poor oral bioavailability with an elimination half-life of 4.5±0.55 h. Thus topical delivery of *B. serrata* is the preferred alternative to oral dosage form. But topical delivery is difficult due to its high lipophilicity (log P 8)<sup>[11]</sup>

Topical gels formulation gives a proper drug delivery system at desired concentration of drug because these are less oily and can be simply remove from the skin. Gel formulations have good applications property and reliability in the

**Corresponding Author:****Dr. Nagoba Shivappa N.,**

Associate Professor and Head,  
Department of Pharmaceutics, Channabasweshwar Pharmacy College,  
Kava Road, Latur-413512, Dist. Latur (M.S), India.

E-mail: nagobashivraj@gmail.com

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November 14, 2018

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**Title of the Paper:** Formulation and Evaluation of fast dissolving tablets containing Amlodipine Besylate

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**International****Journal of Bio-Pharma Research**

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**Open Access****Research Article****Formulation and Evaluation of fast dissolving tablets containing Amlodipine Besylate**

Sugave Ramling V.<sup>1</sup>, Nagoba Shivappa N.<sup>1\*</sup>, Sanjay S. Thonte<sup>2</sup>, Vijayendra Swamy S.M.<sup>1</sup>, Bhosale Pratap H.<sup>2</sup>

<sup>1</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

<sup>2</sup>Channabasweshwar (poly) D. Pharmacy college, Latur, Maharashtra, India.

**Abstract:** In the present work, fast dissolving tablet of Amlodipine besylate was formulated with quick onset of action. The main objective of this study was to formulate and evaluate fast dissolving tablets of amlodipine besylate to achieve a better dissolution rate and further improving the bioavailability of the drug. Fast dissolving tablets prepared by direct compression and using super-disintegrants in different concentration and evaluated for the pre-compression parameters. The prepared tablets were evaluated for post compressional. Among all, the formulation F8 containing 8% w/w super-disintegrant Croscarmellose sodium, Crospovidone and Microcrystalline Cellulose was considered to be best formulation, which release up to 96.50 % in 10 min.

**Key words:** Amlodipine besylate, superdisintegrants, disintegration time, *In vitro* dissolution test

**Introduction**

Rxent advance in novel drug delivery system, aims to enhance the safety and efficacy of the drug molecule by formulating a dosage form being for the administration. Difficulty in swallowing is experienced by patient such as pediatric and geriatric. Fast dissolving tablets are solid dosage form containing medical substances which disintegrate rapidly, usually within few seconds when placed upon tongue requiring no additional water to facilitate swallowing. Amlodipine besylate is a dihydropyridine calcium antagonist (calcium ion-channel blocker) that inhibits the trans-membrane influx of calcium ions into vascular smooth muscle and cardiac muscle. It binds to both dihydropyridine and non dihydropyridine binding sites. The contractile processes of cardiac muscle and vascular smooth muscle are dependent upon the movement of extra cellular calcium ions into these cells through specific ion channels. Direct compression is one of the techniques requires the incorporation of a super-disintegrants into the formulation the use or highly. The basic approach used in development of FDT was the use of superdisintegrants like cross linked Croscarmellose Sodium, and Crospovidone etc. which provide instantaneous disintegration of tablet after placed on tongue, thereby releasing the drug in saliva.

**Material and Methods**

Amlodipine besylate was obtained as a gift sample from Dr. Reddy labs, Hyderabad (India). Crospovidone, Microcrystalline cellulose and Croscarmellose sodium were gift sample from Carex Pharma, Jalgaon. Sodium saccharine was obtained as gift sample from Emcare Pharma, Pune and vanilla flavour were gift samples from Merck Ltd, Mumbai, India. All chemicals and reagents used were of analytical grade.

**Preparation of fast dissolving tablets**

Fast dissolving tablets of Amlodipine besylate were prepared by direct compression method incorporating in different superdisintegrants i.e., Crospovidone (CP), Croscarmellose Sodium (CCS). The Amlodipine Besylate equivalent to 10mg, Sodium saccharine and Microcrystalline Cellulose were mixed thoroughly in glass mortar using a pestle. Superdisintegrants were incorporated in the powder mixture according to each formulation in the tablets and finally Magnesium stearate, Talc and Vanilla flavour was added. The whole mixture was passed through Sieve No. 80 twice. Tablets were prepared using 4 mm round flat-faced punch of the rotary tablet machine. Compression force was constant for all formulations are showed in Table 1.

**Corresponding Author:****Dr. Nagoba Shivappa N.,**

Associate Professor and Head,

Department of Pharmaceutics, Channabasweshwar Pharmacy College,

Kava Road, Latur-413512, Dist. Latur, Maharashtra

E-mail: nagobashivraj@gmail.com

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Sarukh et al

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Research Article

**FORMULATION AND EVALUATION OF HERBAL GEL CONTAINING *Allium cepa* EXTRACT**

Sarukh Vikram S., Nagoba Shivappa N.\*, Hindole S. S., Kaudewar K. D., More Digamber R.

Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

**ABSTRACT**

Herbal medicines widely improved for primary health care because of better cultural acceptability and better compatibility with human body and lesser side effects. The aim of present study was to formulate and evaluate of herbal gel containing *Allium cepa* extract. Topical gel formulation was designed by using *Allium cepa* extract and carbopol 934 as a gelling agent and different excipients. The herbaceous plant *Allium cepa* (onion). It has great health significance and is consumed for nutritional and health benefits for last centuries. It contains flavonoids compound. Plant extract used for prevention of hair loss. Raw onion eaten in salad form this is play very important role in health benefits. Gel was prepared by incorporating extract of *Allium cepa* in gel at a particular step in order to prepare non greasy formulation. Gel Formulation F3 Batch was optimized in the concentration 1.5% of Carbopol 934. Different gel formulations were evaluated for their physical appearance; pH, Spreadability, Homogeneity *in-vitro* diffusion, Viscosity and Drug Excipients comparability study are carried out.

**Keywords:** *Allium cepa*, Carbopol 934, Herbal gel etc.**Article Info:** Received 11 June 2019; Review Completed 23 July 2019; Accepted 04 Aug 2019; Available online 15 August 2019**Cite this article as:**Sarukh VS, Nagoba SN, Hindole SS, Kaudewar KD, More DR, Formulation and Evaluation of Herbal Gel Containing *Allium cepa* extract, Journal of Drug Delivery and Therapeutics, 2019; 9(4-s):492-496  
<http://dx.doi.org/10.22270/jddt.v9i4-s.3300>**\*Address for Correspondence:**

Dr. Nagoba Shivappa N., M. Pharm, Ph.D., Associate Professor and Head, Department of Pharmaceutics, Channabasweshwar Pharmacy College, Kava Road, Latur-413512, Dist. Latur. (MS)

**INTRODUCTION**

Many people are choosing plant based Medicines or products to improve their health. Onion (*Allium cepa* L.) belongs to Family: Liliaceae (Lilies) has been highly valued food and medicinal plant since ancient times used. It is widely cultivated, second only to tomato. Onion vegetable bulb crop known to most of the cultures and consumed worldwide for enhancing the flavour and taste of a different variety of foods. Onion is a well-known traditional nutraceutical and medicinal plant that is cultivated and used around the world. Onions contain phenolics and flavonoids Phytochemicals that have potential anti-inflammatory, anti-cholesterol, anticancer, and antioxidant properties. Onions contain 89% water, 1.5% protein, and vitamins B1, B2, and C, along with potassium and selenium. It also contains polysaccharides such as fructose and, saccharose, peptides, flavonoids (mostly quercetin), and essential oil. Onion contains numerous sulfur compounds. Onion is highly nutritional and its dietary use improves digestion and mental health and lower down toxicity of oils. Onion has potential in treating cardiovascular disease, hypochloremia, and stomach cancer. Plant extract is used for relieving headaches, coughs, and hair loss [1].

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systems in which a liquid phase is constrained within a three dimensional polymeric matrix (consisting of natural or synthetic gums) in which a high degree of physical or sometime chemical cross-linking has been introduced [8].



Allium cepa

Gels are relatively newer class of dosage forms created by entrapment of larger amount of aqueous hydro alcoholic liquids in a network of colloidal solid particles which may



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## FORMULATION AND EVALUATION OF HERBAL GEL CONTAINING *BOSWELLIA SERRATA* FOR ANTIARTHRITIC ACTIVITY

Gaware Rutuja J.<sup>1</sup>, Gaikwad V. M.<sup>1</sup>, Nagoba Shivappa N.<sup>1\*</sup>, Sakhare Ram S. <sup>1</sup>, Wadulkar Raghunath D.<sup>1</sup>, Deshmukh Aditye Y.<sup>1</sup>

<sup>1</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

**\*Corresponding author**

**Dr. Nagoba Shivappa N.**  
M. Pharm, Ph.D.

Associate Professor and Head,  
Department of Pharmaceutics,

Channabasweshwar Pharmacy College,

Kava Road, Latur-413512, Dist. Latur. (MS)

E-mail: [nagobashivraj@gmail.com](mailto:nagobashivraj@gmail.com), [nshivraj11@rediffmail.com](mailto:nshivraj11@rediffmail.com)

### Abstract

*The objective of the present research work was to develop herbal gel of Boswellia serrata (Shallaki gum) for Antiarthritic activity to achieve greater therapeutic effect. It is oleo-gum resin of Boswellia Serrata family-Burseraceae, a tree commonly found in INDIA and used for Rheumatoid arthritis is a chronic, metabolic disorder which affects to joints and periarticular tissue. About 1% of the world's population is affected by rheumatoid arthritis and is two to three times more common in women than men. Rheumatoid arthritis has a various formulation in the market such as tablet, ointment but it has many disadvantages mainly due to low patient acceptance in ointment so, not acceptable in local area.*

*Hence there is need to use ayurvedic formulation, Shallaki is very effective in osteoarthritis, juvenile in rheumatoid arthritis, soft tissue fibrolite and spondylitis without any side effect. The Boswellia Serrata (Shallaki) resin gel prepared by using different gelling agent like Carboxypol, Eudragit, and Pluronic F127 to give the better therapeutic result. All the formulations were subjected for evaluation like physical appearance, PH, in-vitro drug release study, viscosity, spreadability. In order to assess the suitability of the formulations with respect to the dosage form and intended therapeutic purpose, FTIR results showed no interaction between drug and polymers. Boswellia serrata is one specific ayurvedic remedy that was proceeded to extract the gum resin for the treatment of rheumatoid arthritis. The benefits of boswellia are relatively well explained the focus mostly to reduce the inflammation or pain caused due to rheumatoid arthritis.*

**Keywords:** *Boswellia Serrata, Shallaki, Traditional, Rheumatoid arthritis, Herbal gel Synthetic drug, Ayurvedic drug.*

### Introduction

The word "gel" is derived from "gelatin," and both "gel" and "jelly" can be drawn back to the Latin gelu for "frost" and gel are, meaning "freeze" or "congeal." This origin indicates the essential idea of a liquid setting to a solid-like material that does not flow, but is elastic and retains



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## Formulation and Evaluation of Herbal Hair Gel Containing Fenugreek Seed Extract for Nourishment and Hair Growth

Suryawanshi Nishant C<sup>2</sup>, Dr. Vijayendra Swamy S.M.<sup>1</sup>, Nagoba Shivappa N.<sup>2</sup>, Wanje Vaijanti V.<sup>2</sup>

<sup>1</sup>Principal, Channabasweshwar Pharmacy College, Kava Road, Latur

<sup>2</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India

Corresponding Author : Dr. Vijayendra Swamy S.M., E-mail: vijayendraswamy@yahoo.com

### ABSTRACT

The present study now a days many people face the major problem related to hair i.e. hair loss. There are many causes of hair loss physiological conditions, emotional or physical stress, nutritional deficiencies, hormonal disorders one of the due to hormone deficiency of estrogen. External administration of the estrogen could changes the hormonal cycle and increase cancer risk some natural alternative estrogen therapy can be found in the various plants containing natural products those having weak estrogen activity like Phyto-estrogen. Herbal drug has less side effects and more effective as comparative to synthetic drug. Phytoestrogen are competing with the estrogen by the binding to the estrogen receptor and produce estrogen effect, Phytoestrogen in the fenugreek seed. Family – Fabaceae Ethanolic extract of (*Trigonella foenum-graecum*) fenugreek seed prepared for the topical formulation of herbal hair gel formulation by using Carbopol 934 gelling agent, glycerin, pvp, methyl paraben, PEG, Triethanolamine Fenugreek was evaluated for its potency on hair growth activity by in vivo method. In vivo, study 2.5mg of fenugreek extract is used. That is applied on the shaved skin of mice to determine the length of hair and the different cyclic phase of hair follicles like anagen and s phases were will be grow after some time periods. From the study topical use of gel formulation were apply for 30 days .There are use of fenugreek extract containing gel formulation over the shaved skin of mice that shows the significant result by increase the hair growth. The prepared gel was characterized for their physicochemical constants, preliminary phyto-chemical analysis, quantitative analysis, Spread-ability, pH, viscosity, and stability study.

**Keywords:** Fenugreek Seed Extract, Glycerin, Carbopol 934, Hair Growth

### I. INTRODUCTION

The hair has a protective role against the adverse effect of environment, for example temperature and most important role is the aesthetic purpose and if the hair encounters any abnormalities, the confidence of the person will be disturbed or most common abnormality is a depigmentation (gray-hair), dandruff. Now a day's number of people who had suffered from hair loss or hair thinning problem even baldness also is increasing in world wide. Hair loss is


a dermatological disorder and this is the major problem, hair loss is the reduction of hair volume<sup>[1-2]</sup> Hair treatment or nourishment is required. To prevent the hair loss or alopecia is a common patient complaint due to psychological and physical distress. By using hair shampoo or conditioner treatment is not possible and not enough to hair growth as well as roots are living cells that need to be nourished in order to stay healthy; therefore, the administration of hair tonic is also required. to treat the such hair loss alopecia hair fall<sup>[3]</sup>Anti-oxidant present the seeds of

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## **Formulation and Evaluation of Herbal Gel Containing *Punica Ganatum***

**Nagoba Shivappa N.<sup>1\*</sup>, Shinde Nishiganda G.<sup>1</sup>, Sakhare Ram S.<sup>1</sup>, Wadulkar Raghunath D.<sup>1</sup>, Deshmukh Aditye Y.<sup>1</sup>**

Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

**\*Corresponding author**

**Dr. Nagoba Shivappa N. M. Pharm, Ph.D.**

Associate Professor and Head, Department of Pharmaceutics, Channabasweshwar Pharmacy College,  
Kava Road, Latur-413512, Dist. Latur, (MS) Tel: (+91)-2382-641008 (O), (+91)-2382-240008(O) Fax: +91-2382-  
243855, Mobile: +919637908901

E-mail: [nagobashivraj@gmail.com](mailto:nagobashivraj@gmail.com), [nshivraj11@rediffmail.com](mailto:nshivraj11@rediffmail.com)

### **ABSTRACT:**

Research in the field of anti-inflammatory is very recent. The concept of anti-inflammatory is changing day to day. The medicinal plants Punica granatum are richest source for management of the anti-inflammatory. Family Lythraceae is used as hemostatic and anti-inflammatory. The aim of present study is to formulate and evaluate the herbal gel containing pomegranate fruit extract. The pomegranate fruit extract shows the anticancer activity, analgesic and anti-inflammatory activity, Antiepileptic activity, Antidiabetic, hypolipidaemic and antioxidant activity, Prevention of skin damage, Cardio protective, Musculoskeletal. The gel formulation was designed by using Carbopol 934, pomegranate fruit extract propylene glycol, methyl paraben, Propyl paraben and required amount of distilled water. The skin pH was maintained by drop wise addition of Tri-ethanolamine. The prepared gel was characterized for their physicochemical parameters, preliminary phytochemicals analysis, appearance, quantitative analysis, Spreadability, pH, viscosity and extrudability, In-vitro study & stability study.

**Keywords:** Pomegranate fruit, Carbopol 934, anti-inflammatory, gel formulation etc.



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**Name of Author:** Dr. S. N. Nagoba

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## Formulation and Evaluation of Herbal Gel Containing *Solanum Nigrum* Extract

Dr. Nagoba Shivappa N.<sup>1</sup>, Sonkamble Pallavi S.<sup>2</sup>, Sakhare Ram S.<sup>2</sup>, Wadulkar Raghunath D.<sup>2</sup>, Swami Avinash B.<sup>2</sup>

<sup>1</sup>Associate Professor and Head, Department of Pharmaceutics, Channabasweshwar Pharmacy College, Kava Road, Latur, Maharashtra, India

<sup>2</sup>Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India

\*Corresponding author Dr. Nagoba Shivappa, E-mail: [nagobashivraj@gmail.com](mailto:nagobashivraj@gmail.com)

### ABSTRACT

The aim of present study was to formulate and evaluate herbal gel containing *Solanum nigrum* extract for prevention of wound healing. Topical gel formulation was designed by using *Solanum nigrum* extract as API and HPMC E5 as a gelling agent. The herbaceous plant *Solanum nigrum* (kamuni) reported for healing action and newer research studies and methodologies are being carried to find active chemical constituents which not only promise fast healing but also will reduce the complication and cost. Extracts of this medicinal plant are useful in the treatment of several health problems such as bacterial infections, ulcer, cancer, tuberculosis, arthritis and inflammatory. The plant *Solanum nigrum* (kamuni) leaves is the best traditional medicine for the study of wound healing activity. The concept of wound healing is changing from day to day. Ayurveda is the richest source of plant drugs for management of wounds and *Solanum nigrum* L. is one such. The plant is used as haemostatic and wound healing agent from ethno pharmacological point of view. The prepared gel was characterized for their physicochemical parameters i.e., preliminary phytochemical analysis, quantitative analysis, appearance, spreadability, pH, viscosity, in-vitro diffusion study and stability study.

**Keywords :** *Solanum Nigrum*, HPMC E5, Herbal Gel, Wound Healing

### I. INTRODUCTION

[1,2,3,4] Many people are choosing plant based medicines or products to improve their health. *Solanum nigrum* L. belongs to family Solanaceae that has been highly valued food and medicinal plant used since ancient times. *Solanum nigrum* is one of the proven anti-cancer, anti-tubercular, anti-bacterial as well as anti-inflammatory activities. Traditional societies include always exploited edible wild plants to grant an adequate level of nutrition. *Solanum nigrum* is an erect, divaricately branched, unarmed annual herb. A decoction of the stalk, leaves and roots of black nightshade is beneficial for wounds and

cancerous sores. The juice of herb or an ointment prepared from it is externally applied to cure specific skin problems and tumors. *Solanum nigrum* contains an alkaloid, steroidal alkaloid as well as steroidal saponins and glycoproteins exhibiting antitumor activity, flavonoids, tannins, saponins, proteins, carbohydrates, coumarins and phytosterols.

#### Gel

The word gel derived from "gelatin." A gel defined as the semisolid system consisting of dispersion made up of large molecule or small inorganic particle enclosing and interpenetrated by a liquid. Gel comprised of two phases. It should possess suitable





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**Title of the Paper:** Formulation and Evaluation of Medicated Nail Patches Containing Ketoconazole

**Name of Author:** Dr. S. N. Nagoba

**Name of the Journal:** International Journal of Research in Humanities, Arts and Literature

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## FORMULATION AND EVALUATION OF MEDICATED NAIL PATCHES CONTAINING KETOCONAZOLE

Karbhari Vilas N<sup>1</sup>, Gaddime Sonali B<sup>2</sup> & Nagoba Shivappa N<sup>3</sup>

<sup>1</sup>Research Scholar, Maharashtra Poly (D.Pharm) Institute Nilanga, Latur, Maharashtra, India

<sup>2,3</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India

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### ABSTRACT

The present investigation aims to formulate and evaluate a medicated nail patch for the treatment of diseases like Onychomycosis (fungal infection of nail) and psoriasis, Yellow nail syndrome, Paronychia and many others. The objective of this study is to explore the difficulties in penetration of drug across nail plate & to enhance bioavailability of antifungal drugs. Nail drug delivery system is used to reduce such a hazardous systemic effects and provides longer contact time at a site of action. Many formulation of Ketoconazole were prepared by using optimized formula using HPMC100, Eudragit RS100, DCM : methanol, diethyl phthalate, propylene glycol which shows better diffusion & permeation. These are evaluated for various parameters including thickness, folding endurance, weight variation, % moisture uptake, and % moisture loss and in-vitro release (Diffusion) studies in 7.4 pH phosphate buffers. Effects of varying concentration of various polymer and penetration enhancer were studied. The evaluation of that patches is carried out by drug excipient interactions subjecting to FTIR Spectral analysis, in-vitro diffusion studies, drug content analysis, NDSS is used to achieve maximum therapeutic effect along with improve patient's compliance.

**KEYWORDS:** Ketokonazol, HPMC100, Propylene Glycol, Nail Patches, In-Vitro Release

### INTRODUCTION

The transungual drug delivery system in this system Trans means through and unguis means nail. Nail plate is responsible for penetration drug across it. Hence transungual drug delivery system is a system associated with drug delivery across nail barrier to achieve a targeted drug delivery to treat fungal nail diseases. Two main diseases affect the nail unit one is onychomycosis and second one is psoriasis. Treatment of these two diseases usually leads to poor patient compliance. Nail fungal infection treatment are difficult to treat effectively because of insufficient concentration reach to the site of action. The main advantages of nail patches i.e., Patient will not feel like as medication, easily removed when needed and improved patient compliance. There are variety of topical formulations like gels, creams and also ointments which are commonly used for the treatment of nail infections but affect in the treatment is limited because of their relatively low impermeability. Transungual topical administration of therapeutic agents offers many advantages over conventional oral and invasive methods of drug delivery, and also provides controlled release of the drug for extended period of the time.

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Title of the Paper: Formulation and Evaluation of Nanoemulsion for Topical Application

Name of Author: Dr. S. M. Vijayendra Swamy

Name of the Journal: Journal of Drug Delivery & Therapeutics

Shaikh et al

Journal of Drug Delivery & Therapeutics, 2019; 9(4-s):370-375

Available online on 15.08.2019 at <http://jddonline.info>



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Research Article

### Formulation and Evaluation of Nanoemulsion for Topical Application

Shaikh Neha M., Vijayendra Swamy S. M.\*, Nagoba Shivappa N., Kulkarni K. B.

Channabasweshwar Pharmacy College, Latur, Maharashtra, India

#### ABSTRACT

The aim of present research is to design and develop nanoemulsion of *Econazole nitrate* as effective treatment for *Trichophyton* fungal disease. *Econazole nitrate* is an imidazole antifungal agent with broad spectrum activity. It belongs to BCS class II i.e. low soluble and highly permeable drug. Due to its poor solubility, it is incompletely absorbed after oral dosing and bioavailability varies among individuals. The drug efficacy of topical formulation can be limited by instability due to its poor solubility in the vehicle and low permeability. Therefore, to overcome these problems nanoemulsions have been designed. Topical nanoemulsion containing 1 % *Econazole nitrate* with different oils (oleic acid), surfactant (tween 20), co-surfactant (PEG 200, PEG 400) and distilled water. Various oil-in-water nanoemulsions are prepared by the spontaneous emulsification method. The nanoemulsion formulations that passed thermodynamic stability tests were characterized for appearance, pH, FTIR, viscosity, drug content, % drug entrapment efficiency and *in-vitro* drug release study of *Econazole nitrate* determined by Franz diffusion cell and stability study.

**Keywords:** Nanoemulsion, Topical drug delivery, *Econazole nitrate*, Viscosity, *In-vitro* drug release etc.

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#### \*Address for Correspondence:

Dr. Vijayendra Swamy S.M., M. Pharm, Ph.D., Principal, Channabasweshwar Pharmacy College, Kava Road, Latur-413512, Dist. Latur. (MS)

#### INTRODUCTION:

Nanoemulsion are defined as isotropic, thermodynamically stable transparent or translucent systems of oil and water which stabilize by surfactant with a droplet size usually in the range of 5 to 200 nm. Nanoemulsion having various advantages over the macroemulsion are as follows i.e., Nanoemulsions have a much higher surface area and free energy than macroemulsions that make them an effective transport system. This system does not show the problems of inherent creaming, flocculation, coalescence and sedimentation, which are commonly associated with macroemulsions. Nanoemulsions can be developed by spontaneous emulsification method to enhance the solubility and bioavailability of poorly water soluble drugs. These are non-toxic non-irritant hence can be easily applied to skin and mucous membranes. The use of nanoemulsion as delivery systems can improve the efficacy of a drug, allowing the total dose to be reduced and thus minimizing side effects.

Nanoemulsion used as drug carrier in topical treatment of diseases especially in skin disease. They are able to incorporate a variety of hydrophobic and hydrophilic drugs to improve the accumulation of drug at the site of action and

to decrease side effects. Nanoemulsion can provide sustained and controlled release of entrapped drug.

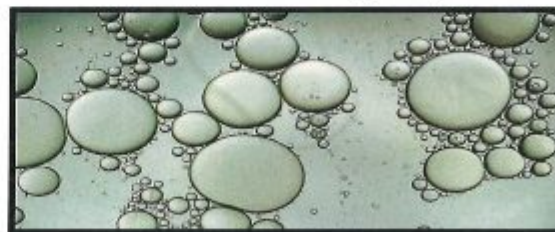


Figure 1: Nanoemulsion

In this formulation antifungal drug *Econazole nitrate* used to formulate nanoemulsion. Various conventional topical doses forms of *Econazole nitrate* are available such as cream and lotion however side effects are associated with *Econazole nitrate* therapy such as irritation, pain and redness; to overcome these problems *Econazole nitrate* nanoemulsion is prepared. *Econazole nitrate* belongs to BCS class II i.e. poorly soluble and highly permeable drug. Due to (poor solubility, it

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## Formulation and Evaluation of Transdermal Patches Containing Antidiabetic Drug

Kaudewar K. D.<sup>1</sup>, Nagoba Shivappa N.<sup>2\*</sup>, Ningule Ganesh M.<sup>2</sup>, Shaikh Atiya L.<sup>2</sup>

<sup>1</sup>Channabasweshwar (Poly) D. Pharmacy College, Latur, Maharashtra, India.

<sup>2</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

### Abstract:

The present investigation of aim to formulate & evaluate medicated transdermal patches containing antidiabetic drug. An optimal penetration enhancer would improve drug delivery of transdermal patches containing different polymer. Matrix type transdermal patches prepared by using different ratio of Eudragit RS100, HPMC100M, by using solvent evaporation techniques. All the prepared formulation were subjected to evaluation studies i.e., weight variation, thickness, drug content, moisture content, moisture uptake, flatness and in-vitro drug release. Compatibility study between drug and polymer can be done by FTIR. From the all formulation batch F3 was optimized formula. Shows linear zero order release for 24 hrs with cumulative % drug diffusion of 88.34% from 4cm<sup>2</sup> patches. It is concluded that concentration of polymer (HPMC100M) when increases into primary layer, then In-vitro diffusion rate also increases and concentration of Eudragit Rs100 when increases, the drug diffusion decreases. It provides better controlled drug release for patch.

**Key words:** Glimperide, Matrix Type Transdermal Patch, Eudragit RS 100, In-Vitro Permeation study etc.

### \*Corresponding author

**Dr. Nagoba Shivappa N. M. Pharm, Ph.D.**

Associate Professor and Head,

Department of Pharmaceutics,

Channabasweshwar Pharmacy College,

Kava Road, Latur-413512, Dist. Latur. (MS)

Tel: (+91)-2382-641008 (O), (+91)-2382-240008(O) Fax: +91-2382-243855

Mobile: +919637908901

E-mail: nagobashivraj@gmail.com, nshivraj11@rediffmail.com



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**Name of the Journal:** International Research Journal of Management Science and Technology

**IRJMST** Vol 10 Issue 8 [Year 2019] **ISSN** 2250 – 1959 (Online) 2348 – 9367 (Print)

## PREPARATION AND EVALUATION OF HERBAL GEL CONTAINING FENUGREEK SEED EXTRACT FOR HAIR GROWTH

Suryawanshi Nishant C<sup>1</sup>, Vijayendra Swamy S.M.<sup>1</sup>, Nagoba Shivappa N.<sup>1</sup>, More Digamber R.<sup>1</sup>

<sup>1</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

\*Corresponding author

**Dr. Vijayendra Swamy S.M.**

M. Pharm, Ph.D.

Principal,

Channabasweshwar Pharmacy College,

Kava Road, Latur-413512, Dist. Latur. (MS)

E-mail: [vijayendraswamy@yahoo.com](mailto:vijayendraswamy@yahoo.com)

### Abstract

In the recent study many people's suffering from hair related problems like hair loss i. e alopecia. Hair loss problem is of great significance to both men and women. The essential issues associated with hair loss are hair fading, dandruff, and falling of hair. Alopecia is the medical term for hair loss or baldness. It is an embarrassing condition for any person as he/she looks extra aged than ordinary. Many forms of medication are available to treat alopecia in special procedure of medication such as Allopathic, Homeopathic, and Ayurveda or can also be surgical like hair transplantation; Various herbs are being used to preclude the hair loss and remorse of hairs including Aloe vera, brahmi, nagarmotha, amla, and Trigonella foenum-graecum, belonging to family Fabaceae, has been used traditionally for various pharmacological effects, such as anti-diabetic, anti-cancer, anti-fungal, antipyretic, ant bacterial .in the trigonella foenum graecum seed extract formulation of hair gel use the carbopol 934, as a gelling agent , glycerin, pvp,methyl paraben ,PEG , triethanolamine . .The prepared gel was characterized for their physicochemical constants, preliminary phyto-chemical analysis, quantitative analysis, Spread-ability, pH, viscosity, stability study.

**Keywords:** Fenugreek seed extract, glycerin, carbopol 934, Hair growth, etc.

### 1. INTRODUCTION:

Hair is among the valuable parts of the body derived from ectoderm of the skin and is a protective appendage on the body. 70-100 hairs loss a day is a very common; however, dropping over 100 hairs a day lasting longer than a couple of weeks indicates a serious problem. Alopecia is the scientific term for hair loss or baldness. It happens from numerous explanations, and the special identification is not often feasible. Alopecia by and large begins with one or more small, circular, delicate bald patches on the scalp and can growth to whole scalp hair loss or whole body hair loss.

Hairs can be defined as – "Modified epithelial structure formed as a result of keratinization of germinative cells." Hair is composed of keratin with chemical constituents such as carbon, hydrogen , nitrogen , sulfur , and oxygen . Hair growth varies from person to person but on an average hair grows about 5-10 mm/month. Maximum growth of hairs takes place at the age of about 15-30 years. Scalp (skin on head) consists of seven components. to treat the such hair loss alopecia hair fall. Anti-oxidant present the seeds of T. foenum graecum have been very used as anti-lice, anti dandruff activity as well as hair growth and soothing effects produce.<sup>[1]</sup>



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Phone No. (02382) 240192, Fax-(02382) 243855

Email- [channabasweshwar@gmail.com](mailto:channabasweshwar@gmail.com) Website- [www.cdphi.org](http://www.cdphi.org)

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DTE Code :- 2253, University Code :- 947

**Title of the Paper:** Synthesis And Biological Evaluation Of 2-Phenylpyrido [2,3-D] Pyrimidine Derivatives As Cyclin-Dependent Kinase (CDK) Inhibitors

**Name of Author:** Mr. V. B. Panchabhai

**Name of the Journal:** Indian Drugs

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**Title of the Paper-** Synthesis and evaluate silver nanoparticles Containing *Momordica charantia* Linn

**Name of Author-** Mr. A.V. Moholkar

**Name of the Journal-** International Journal of Bio-Pharma Research

ISSN: 2287-6898

**International****Journal of Bio-Pharma Research**

Volume 8, Issue 8 (2019) pp.2775-2780

**Open Access****Research Article****Synthesis and evaluate silver nanoparticles containing *Momordica charantia* Linn.**

Moholkar Aparark V.<sup>1\*</sup>, Judge Dhanraj R.<sup>2</sup>, Nagoba Shivappa N.<sup>1</sup>, Ghale Ganesh N.<sup>1</sup>

<sup>1</sup>Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra, India.

<sup>2</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

<sup>3</sup>Womens college of Pharmacy, Peth Vadgaon, Kolhapur, Maharashtra, India.

**Abstract:** The physicochemical and optoelectronic properties of metallic nanoparticles are strongly dependent on the size and size distribution of the nanoparticles. In this study, the silver nanoparticles were synthesized from the leaf extract of *Momordica charantia* at room temperature as well as stirred at 60°C. The effects of different leaf extract concentrations, metal ions concentration, reaction times and reaction temperatures on the synthesis of silver nanoparticles were evaluated. The nanoparticles were characterized by UV-Visible, XRD, SEM, and FTIR. The UV-Vis spectra showed that the Surface Plasmon Resonance peak of silver colloids synthesized from *Momordica charantia* leaf extract was observed at 426 nm for stirred at 60°C and room temperature condition. X-ray diffraction (XRD) analysis confirmed that the nanoparticles were crystalline in nature with Face Centered Cubic structure. Scanning Electron Microscopy (SEM) analysis showed that silver nanoparticles were spherical in shape. The FTIR measurement was carried out to identify the possible functional groups responsible for the efficient stabilization of silver nanoparticles.

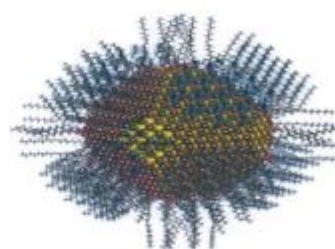
**Key words:** *Momordica charantia*; size and size-distribution; XRD; Silver Nanoparticles

**Introduction**

Nanotechnology is a broad-based science involving manipulation of atoms, electrons, protons and neutrons in a variety of ways to generate new understanding of how materials can be developed to solve many problems in medicine, engineering, agriculture, surface science, marine science, and geology. It involves in the dimensions at nanoscale size ranging up to 100 nm. Nanoparticles has potential applications in various fields such as healthcare, food and feed, cosmetics, environmental health, biomedical science, chemical industries, drug and gene therapy, electronics, mechanics, and space industries. It also has been achieved extensively in the drug delivery system for the treatments of cancer, diabetes, allergy, infection and inflammation.

In recent years Green synthesis provides an advancement over chemical and physical method as it is cost effective, environment friendly, easily scaled up for large scale synthesis. This technique eliminates the use of energy, high pressure, temperature and toxic chemicals. As plant medicated nanoparticles preparation is easy to

handle, safe and economical. It finds more advantages over chemical and physical method. In biological method plants have been used for the synthesis of nanoparticles were coated by the plant extract which has medical benefits and can be used as drug and cosmetic application.



**Figure:** Nanoparticles

*Momordica charantia* or Bitter Melon is a Tropical vegetable, is a common food in Indian cuisine and is used extensively in folk medicine as a remedy for diabetes. Bitter melon has been used in various Asian traditional medicines for a long time. The

**Corresponding Author:**

**Mr. Moholkar Aparark V.,**

Assistant Professor, Department of Pharmaceutics,  
Channabasweshwar Pharmacy College, Kava Road,  
Latur-413512, Dist. Latur, (MS), India.

E-mail: [pranavmoholkar@gmail.com](mailto:pranavmoholkar@gmail.com)

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Email- [channabasweshwar@gmail.com](mailto:channabasweshwar@gmail.com) Website- [www.cdphl.org](http://www.cdphl.org)

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DTE Code :- 2253, University Code :- 947

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**Name of Author:** Dr. O.G. Bhusnure

**Name of the Journal:** Indian Drugs

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#### PHARMACOGNOSTIC STANDARDIZATION OF JACARANDA MIMOSIFOLIA LEAVES AND STEM BARK

Patilkar R. G.<sup>1\*</sup> and Bhusnure O. G.<sup>2</sup>

<sup>1</sup> CRPS, Nanded Pharmacy College, Nanded - 431 602, Maharashtra, India  
<sup>2</sup> Channabasweshwar Pharmacy College, Latur - 413 512, Maharashtra, India  
\*For Correspondence: E-mail: [rampatilkar@gmail.com](mailto:rampatilkar@gmail.com)

<https://doi.org/10.53879/ind.58.06.11385>

**ABSTRACT**

pharmacognostic standardization is a basic criterion to assure authenticity and quality of any medicinal plant. In the present study micromorphological examinations along with proximate analysis, fluorescence and elemental analysis of Jacaranda mimosifolia leaves and stem bark were carried out. Morphological examination indicated compound, bipinnate and alternately arranged leaves having several pairs of leaflets. The leaflets were oblong elliptical in shape with parallel venation, acute apex and entire margin. The stem bark was concavely curved, greyish brown colored with conical shaped buds on the surface. Microscopic examination of leaves presented dorsiventral lamina, unicellular pointed trichomes, vascular bundle, collenchyma tissues and calcium oxalate crystals while bark indicated cork, stone cells, lignified fibres, calcium oxalate prisms, starch grains and medullary rays. Elemental analysis revealed the presence of aluminum, chlorides and iron in leaves and bark of Jacaranda mimosifolia. The present study will assist as an important source of information in identification and further investigation of this plant.

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**Name of Author:** Dr. O.G. Bhusnure

**Name of the Journal:** Journal of Drug Delivery & Therapeutics

Gholve et al

Journal of Drug Delivery &amp; Therapeutics, 2019; 9(4-s):343-347

Available online on 15.08.2019 at <http://jddtonline.info>**Journal of Drug Delivery and Therapeutics**

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Research Article

**RP-HPLC Method Development and Validation for Determination of Didanosine in Pharmaceutical Dosage Forms**Sachin Gholve<sup>1\*</sup>, Sharddha Gangapure<sup>1</sup>, Mahesh Birajdar<sup>2</sup>, Imran Mujewar<sup>1</sup>, Omprakash G Bhusnure<sup>1</sup><sup>1</sup>Department of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Kava Road, Basweshwar Chowk, Latur, Maharashtra, India-413512<sup>2</sup>Department of Pharmaceutical Chemistry, Channabasweshwar Pharmacy College (Degree) Kava Road, Basweshwar Chowk, Latur, Maharashtra, India-413512**ABSTRACT**

To develop a simple, cheap, accurate, and rapid Reverse Phase High Performance Liquid Chromatographic (RP-HPLC) method and validate as per ICH guidelines for estimation of Didanosine in pharmaceutical dosage forms. The separation was conducted by using mobile phase consisting of methanol: water in the ratio (30:70). The wavelength was found at 246nm. Agilent 1220 Infinity LC with ezchrome software is used for chromatographic determination. The separation was conducted by using Zebra Eclipse XDB-C 18 (4.6×250×5µm) at the flow rate of 1.0 ml/min using variable wavelength detector. The developed method resulted in didanosine eluting at 4.650 min. The method was found to be linear over the concentration range 2-12µg/ml with coefficient regression R<sup>2</sup> 0.997. Mean recovery was found to be in the range of 99.99%, during accuracy studies. The limit of detection (LOD) and limit of quantification (LOQ) was found to be 5 µg/ml and 16 µg/ml respectively. A cheap, accurate, precise, linear and rapid RP-HPLC method was developed and validated for the quantitative estimation of Didanosine as per ICH guidelines.

**Keywords:** RP-HPLC, Didanosine, Method Validation**Article Info:** Received 18 June 2019; Review Completed 24 July 2019; Accepted 29 July 2019; Available online 15 August 2019**Cite this article as:**Gholve S, Gangapure S, Birajdar M, Mujewar I, Bhusnure OG, RP-HPLC Method Development and Validation for Determination of Didanosine in Pharmaceutical Dosage Forms, Journal of Drug Delivery and Therapeutics, 2019; 9(4-s):343-347 <http://dx.doi.org/10.22270/jddt.v9i4-s.3328>**\*Address for Correspondence:**

Sachin Gholve, Department of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Kava Road, Basweshwar Chowk, Latur, Maharashtra, India-413512

**INTRODUCTION:**

Didanosine chemically 2', 3'- dideoxyinosine (fig1) is an antiretroviral medication used to treat HIV/AIDS in combination with other medications as part of highly active antiretroviral therapy. An extensive review of the literature revealed a few analytical methods (1-12), was reported for the estimation of didanosine in dosage forms. Didanosine is a dideoxy analogue of the purine nucleoside inosine that potentially inhibits the replication of the human immunodeficiency virus. Analogue to other nucleoside inhibitors, this compound also requires intracellular metabolism to the active triphosphate, 2', 3'- dideoxyinosine-5-triphosphate (ddATP), which act as a competitive inhibitors of HIV reverse transcriptase or as a DNA chain transmitter. (13-14) Validation is the process of providing documented evidence that a method is fit for its intended use. In other word the process of method validation ensures that the proposed analytical methodology is accurate, specific, reproducible and rugged for its intended use. Analytical

techniques have different degrees of sophistication, sensitivity and selectivity, as well as, different cost and time requirements.

**MATERIALS AND METHODS****Chemicals and Reagents**

Water, Methanol, Acetonitrile of Analytical and HPLC grade purchased from Arti pharmaceuticals (Mumbai). Ammonium acetate buffer of AR grade purchased from Raj Chemicals (Latur).

**Instrument**

HPLC analysis was performed on Agilent 1220 Infinity LC with EZchrome software with variable wavelength detector. With made of Agilent technologies, A manually operating Rheodyne injector with 20µl sample loop was equipped with the HPLC system. Zobrax Eclipse XDRC18 column (4.6×150×5µm), Electronic weighing balance BL-220 H

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**Title of the Paper:** Synthesis, Molecular Docking and SAR Study of Isoniazid Incorporated 2-Sulfanylquinazoline as Novel Inhibitors of Protein Kinase B

**Name of Author:** Dr. A. N. Deshpande

**Name of the Journal:** International Journal of Advanced Science and Technology.

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### Synthesis, Molecular Docking and SAR Study of Isoniazid Incorporated 2-Sulfanylquinazolines as Novel Inhibitors of Protein Kinase B

A. N. Deshpande, S. C. Dhawale, S. B. Bari, C. G. Bonde

#### Abstract

The protein kinase B (PknB) of *Mycobacterium tuberculosis* is an attractive potential target in sustaining mycobacterial growth. In this study, a new series of isoniazid incorporated 2-sulfanylquinazoline derivatives were synthesized and characterized. These compounds were screened for their in vitro antitubercular activity against *Mycobacterium tuberculosis* H37Rv strain. The antitubercular results have pointed towards the equal potency of compounds 5B<sub>8</sub>, 5B<sub>9</sub> and 5B<sub>10</sub> with minimum inhibitory concentrations (MICs, 6.25 µg/ml) comparable to reference standard streptomycin with selectivity indices of 1.6, 4.8 and 4 respectively. In vitro cytotoxicity data using THP-1 cells specified that the most potent compounds 5B<sub>8</sub>, 5B<sub>9</sub> and 5B<sub>10</sub> were found to be non-toxic (=50% inhibition). The structure-activity relationships indicated that the electron donating substituents like -NH<sub>2</sub>, -OH, alkyl groups with aliphatic chain length up to C-4 and aryl groups at position-2 of quinazoline, were identified as key determinants of the antitubercular activity. Docking studies on protein kinase B explained the higher potency of compounds based on binding poses of molecules.

#### How to Cite

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**Name of Author:** Dr. O.G. Bhusnure

**Name of the Journal:** Journal of Heterocyclic Chemistry

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## Design and Synthesis of New Aryloxy-linked Dimeric 1,2,3-Triazoles *via* Click Chemistry Approach: Biological Evaluation and Molecular Docking Study

Tejshri R. Deshmukh, Smita P. Khare, Vagolu S. Krishna, Dharmarajan Sriram, Jaiprakash N. Sangshetti, Omprakash Bhusnure, Vijay M. Khedkar, Bapurao B. Shingate ✉

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### Abstract

A quest for more potent new antitubercular agents has prompted to design and synthesize aryloxy-linked dimeric 1,2,3-triazoles (**4a–j**), from azides (**2a–e**) and bis(prop-2-yn-1-yloxy)benzene (**3a–b**) on 1,3-dipolar cycloaddition reaction *via* copper (I)-catalyzed click chemistry approach with good to better yields. The titled compounds (**4a–j**) were designed using molecular hybridization approach by assembling various bioactive pharmacophoric fragments in a single molecular framework. All the synthesized compounds have been screened for their *in vitro* antitubercular, antifungal, and antioxidant activities against their respective strains. Among them, **4h** and **4i** show the highest antifungal activity, whereas compounds **4h**, **4i**, and **4j** have revealed promising antitubercular activity against their respective strains. In addition to this, most of the synthesized compounds were found as potent antifungal and antioxidant agents. A significant network of bonded and non-bonded interactions stabilized these molecules into the active site of fungal CYP51 that is realized from the obtained well-placed docking poses and the associated thermodynamic interactions with the enzyme. The synthesized compounds have also been analyzed for absorption, distribution, metabolism, and excretion properties.

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**Name of Author:** Dr. O. G. Bhusnure

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Wattamwar et al

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Research Article

### Formulation and Evaluation of Traditional Antioxidant Grape Seeds Extract in the Form of Tablets

Wattamwar P. B.<sup>1\*</sup>, Upase A., Gholve S. B.<sup>1</sup>, Zingade S. G.<sup>2</sup>, Bhusnure O. G.<sup>1</sup>,

Channabasweshwar Pharmacy College, Latur, Maharashtra, India

#### ABSTRACT

Oxygen uptake while breathing cause's free radical production and in addition to that environmental factors such as pollutants, smoke and certain chemicals also contribute to their formation. Reactive oxygen species is a collective term that includes all reactive forms of oxygen, including both oxygen radicals and several non-radical oxidizing agents that participate in the initiation and/or propagation of chain reaction. Free radicals are atoms, molecules or ions with unpaired electrons that are highly unstable and active towards chemical reactions with other molecules. Antioxidant is any substance that when present at low concentrations compared to those of an oxidizable substrate significantly delays or prevents oxidation of that substrate. Antioxidants block the process of oxidation by neutralizing free radicals. Antioxidant power of proanthocyanidins is 20 times greater than vitamin E and 50 times greater than vitamin C. Proanthocyanidins in Grape seeds have been shown to exhibit strong antioxidant, antimutagenic, anti-inflammatory, anticarcinogenic and antiviral activity.

**Keywords-** Antioxidants, Grape seed, Proanthocyanidins, DPPH activity.

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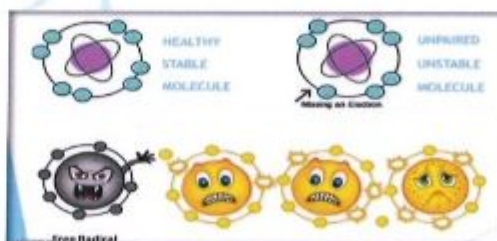
Wattamwar PB, Upase A, Gholve SB, Zingade SG, Bhusnure OG, Formulation and Evaluation of Traditional Antioxidant Grape Seeds Extract in the Form of Tablets, Journal of Drug Delivery and Therapeutics, 2019; 9(5):110-113  
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#### \*Address for Correspondence:

Wattamwar P. B., Channabasweshwar Pharmacy College, Latur, Maharashtra, India

#### INTRODUCTION-

Oxygen is an indispensable element for life, under certain situations has severe deleterious effects on the human body. The negative effects of oxygen are due to the formation and activity of number of chemical compounds, known as reactive oxygen species (ROS). Reactive oxygen species is a collective term that includes all reactive forms of oxygen, including both oxygen radicals and several non-radical oxidizing agents that participate in the initiation and/or propagation of chain reaction.<sup>1</sup> Oxygen uptake while breathing causes free radical production and in addition to that environmental factors such as pollutants, smoke and certain chemicals also contribute to their formation. In turn, these radicals can start chain reactions in cells and it can cause damage or death to the cell. Chemical compounds capable of generating potential toxic oxygen species can be referred to as 'Pro-oxidants.' In normal cell, there is an appropriate pro-oxidant-antioxidant balance. However, this balance can be shifted towards pro-oxidants when production of oxygen species is increased greatly or when level of antioxidants are diminished. This state is called as 'oxidative stress'.<sup>2</sup>



**Fig. No: 01 Effect of free radicals on body tissue**

The most common oxidants in biological systems are free radicals. Free radicals are atoms, molecules or ions with unpaired electrons that are highly unstable and active towards chemical reactions with other molecules. Free radicals are parts of groups of molecules called reactive oxygen species (ROS), reactive nitrogen species (RNS) and reactive sulphur species (RSS).<sup>3</sup>

Free radicals can be formed in 3 ways, (i) by hemolytic cleavage of covalent bond of a normal molecule, with each





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**Name of Author:** Dr. S. B. Gholve

**Name of the Journal:** Journal of Drug Delivery & Therapeutics

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**UV Spectrophotometric Stability Indicating Method Development and Validation for the Determination of Finasteride Bulk and Dosage Form.**

Shraddha T. Nemane, Sachin B. Gholve\*, Omprakash G. Bhusnure, Trupti M. Rajmanya, Shivani V. Kaulkhere, Sagar S. Waghmare

Department of Quality Assurance, Channabasweshwar Pharmacy College, Latur - 413512, Maharashtra, India

**ABSTRACT**

A simple, specific and economic UV spectrophotometric method has been developed using as diluents Methanol to determine the finasteride content in bulk and pharmaceutical dosage formulations. The quantitative determination of the drug has been carried out at a predetermined  $\lambda_{max}$  of 255 nm, it was proved linear in the range 2-12  $\mu\text{g/ml}$  and exhibited good correlation coefficient ( $R^2=0.999$ ) and excellent mean recovery (98-99%). LOQ and LOD were found to be 1.178 $\mu\text{g/ml}$  and 5.40 $\mu\text{g/ml}$  respectively. The method was validated statically and by recovery studies for linearity, precision, repeatability and reproducibility as per ICH guideline. The obtained results proved that the method can be employed for the routine analysis of finasteride in bulk as well as in the commercial formulations.

**Keywords:** Finasteride, UV Spectroscopy, Method Validation.

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**\*Address for Correspondence:**

Sachin B. Gholve, Department of Quality Assurance, Channabasweshwar Pharmacy College, Latur - 413512, Maharashtra, India

**INTRODUCTION****Analytical method development**

Analytical methods are planned to establish the identity, purity, physical characteristics and potency of the drugs and to support drug testing against specifications during manufacturing and quality release operations as well as during long term stability studies.

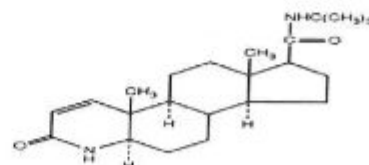
**Method validation**

Validation of an analytical method is the process by which it is established, by laboratory Studies, that the performance characteristics of the method meet the requirements for the intended analytical applications.

Finasteride chemically (5 $\alpha$ , 17 $\beta$ )-(1,1-Dimethylethyl)-3-oxo-4-azaandrost-1-ene-17-carboxamide. Finasteride is an antiandrogen which acts by inhibiting 5- $\alpha$  reductase, the enzyme that converts testosterone to dihydrotestosterone. It is used as antiandrogen, Finasteride is used to shrink an enlarged prostate in adult men. Scalp hair loss in men. It can also be used to treat excessive hair growth in women and as a part of hormone therapy for transgender women.

Literature survey reveals HPLC method development for the determination of Finasteride. In this study, efforts were

made to develop a simple, easy and economic UV spectrophotometric method using a diluents methanol for the determination of finasteride in raw material as well as in the marketed dosage formulations. The developed method was optimized and validated as per the guidelines of International Council on Harmonisation (ICH) and demonstrated excellent specificity, linearity, precision and accuracy for finasteride.



Chemical structure of Finasteride

**MATERIALS AND METHODS****Instruments**

A Shimadzu UV-visible spectrophotometer (UV1800, Shimadzu Corporation, Kyoto, Japan) was used for all absorbance measurements with matched quartz cells.

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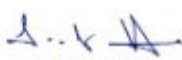
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# Channabasweshwar Pharmacy College (Degree)

Kava Road, Basweshwar Chowk, Latur-413512 (Maharashtra)

Phone No. (02382) 240192, Fax-(02382) 243855

Email- channabasweshwar@gmail.com Website- www.cdphl.org

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## RESEARCH ARTICLE

### DESIGN, DEVELOPMENT AND EVALUATION OF MICROEMULGEL CONTAINING ECONAZOLE NITRATE

\*Nagoba Shivappa, N., Mandurke Arjun, D., Bhalekar Rohini, V. and Ningule Ganesh, M

Channabasweshwar Pharmacy College, Latur, Maharashtra, India

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#### ABSTRACT

The study was designed with the aim to evaluate Econazole nitrate Microemulgel for a treatment of fungal infection. Microemulgel is isotropic mixtures of oil, water and emulsifying agent. Recently, Microemulgel has emerged as one of the most interesting topical preparation in the field of pharmaceutical sciences. The use of Microemulgel as a delivery system has several advantages such as ease of administration, increased residence time of drug at applied site, better drug release, good thermodynamic stability and higher transdermal permeability over conventional formulation. The objective of the study was to prepare Microemulgel of Econazole nitrate, using Carbopol 940 and HPMC [9004-65-3] as a gelling agent, oil phase, preservative, emulsifying agent and buffers were used as penetration enhancer. All the prepared Microemulgel formulations showed acceptable physical properties, appearance, spreadability, homogeneity, viscosity, pH, and formulations were tested for drug excipient interactions subjecting to FTIR Spectral analysis, Skin irritation test, In-vitro drug diffusion studies showed 98.89% for F9 Formulation maximum release of drug in 120 minutes and Stability Studies. The clinical evaluation proved the efficacy and tolerability of this preparation in the treatment of various topical fungal infections. Topical antifungal treatment was successfully achieved with Econazole nitrate microemulgel.

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#### INTRODUCTION

Topical therapy has been used for centuries for the treatment of fungal infection. The spectrum of drugs/agents applied directly to the skin ranges from anti-inflammatory, antiseptic, antibacterial, antifungal, antiviral, anti-acne, anti-pigmentary, anesthetic compounds to skin emollients and protectants. Topical route has the main advantage of direct delivery of drug to the target tissue i.e. skin and mucous membranes, by passing the first-pass effect. However, skin permeation of a drug moiety from topical formulation is a multi-step process. The formulation and development of novel drug delivery system with the nature of enhancing the effectiveness of existing of drug is an ongoing process in pharmaceutical research. The concept of microemulsion was first introduced by Hoar and Schulman during 1940s. While microemulgel is the combined form of microemulsion and gel have advantage of both. In recent year the focus of pharmaceutical researches gradually shifting to the development of drug delivery systems rather than finding newer chemical entities for an improved formulation drug therapy. Over the last decade, the treatment of illness has been carry out by administering drug to human

body via various routes namely oral, sublingual, rectal parental etc. when these systems are fail to administration of drug that time use topical drug delivery system. Topical drug delivery system define as the application of drug containing formulation directly to the skin to treat cutaneous disorder with the intent of containing the pharmacological or other effect of the drug to the surface of the skin. Now a day's scenario pharmaceutical researches work is focused to fulfill the therapeutic needs of patients. Most widely used drugs when given by oral route have side effects like gastric irritation, nausea, bleeding in gastrointestinal tract etc. In order to minimize such side effects and systematic toxicities and also achieve better therapeutic effects one of the promising method is to administered drug via skin or, in short by topical drug delivery system. Gels as topical drug delivery system possess a number of advantages like ease of application, less greasy and easily removed. In spite of many advantages of gels a major limitation is in the delivery of hydrophobic drugs. So to overcome this limitation microemulgel are prepared and with their use even a hydrophobic drug can enjoy the unique properties of gel. Microemulgel are the combination of microemulsion and gel. In recent years there has been great interest in the use of novel polymers with complex functions as emulsifiers and thickeners because the gelling capacity of these compounds allows the formulation of stable emulsions and creams by decreasing

\*Corresponding author: Nagoba Shivappa, N.,  
Channabasweshwar Pharmacy College, Latur, Maharashtra, India  
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**Name of Author:** Dr. O. G. Bhusnure

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## DEVELOPMENT AND VALIDATION OF UV SPECTROSCOPIC METHOD FOR THE DETERMINATION OF BISOPROLOL FUMARATE TABLETS

Bhusnure O. G.<sup>1\*</sup>, Dongare R.B.<sup>1</sup>, Gholve S.B.<sup>1</sup>, Rajmane T<sup>1</sup>, M., Munde Anoop B.<sup>2</sup> and Giram P.S.<sup>2</sup>

<sup>1</sup>Channabasweshwar Pharmacy College, Dept of Quality Assurance, Latur (MS), India

<sup>2</sup>Channabasweshwar Pharmacy College, Dept of Pharmacology, Latur (MS), India

\*Corresponding Author Email: [omprakashbhusnure@gmail.com](mailto:omprakashbhusnure@gmail.com)

### ABSTRACT

In this study a simple, greenar, cost effective, accurate and precise UV- spectrophotometric method was developed for the estimation of bisoprolol fumarate (BF) in bulk and tablet dosage form. The method was based on measurement of absorbance of BF aqueous solution at 223nm. Validation was conducted in accordance to ICH guidelines. Method development was carried out in solvent water as green solvent at 233 nm. The beer's law was obeyed in the concentration range of 2.0 –12.0 µg/ml ( $r^2 = 0.9962$ ). The method was tested and validated for various parameters according to ICH guidelines. The detection and quantitation limits were found to be 0.04753 and 0.1584 µg /ml respectively. The proposed methods were successfully applied for the determination of bisoprolol fumarate in pharmaceutical preparations. The results demonstrated that the procedure is accurate, precise and reproducible (R.S.D. < 2%). The recovery percentage was 100.1 ± 2%.

### KEY WORDS

Bisoprolol fumarate; UV spectrophotometric method, Eco-friendly.

### 1. INTRODUCTION

#### Spectroscopy Methods

#### Ultraviolet-visible Spectrophotometry

UV-Visible spectrophotometry is one of the most frequently employed technique in pharmaceutical analysis. The fundamental law that governs the quantitative spectrophotometric analysis is the Beer - Lambert law . There are few spectrophotometric methods for the assay of beta blockers and fewer for bisoprolol. It should be noted that the actual spectrophotometric methods used for bisoprolol determination are UV-based.<sup>[1,2]</sup>

The aim of this method is being to develop and validate a simple, precise and accurate spectrophotometric method for the estimation and quantification of bisoprolol fumarate in bulk material and in tablets. Further, this study is designed to validate the developed methods as per ICH guidelines. This method is based on

first-order derivative spectroscopy. Derivative spectrophotometry is a useful technique for qualitative and quantitative analysis and helps in reducing the effects of spectra. Derivative spectroscopy very useful in qualitative analysis, either for characterizing Materials or for identification Derivative spectra can be obtained by optical, electronic, or mathematical methods. The advantages of the mathematical techniques are that derivative spectra may be easily calculated. derivative spectrophotometry was used.<sup>[3,4,5,6]</sup>

Bisoprolol fumarate It is an official in BP, USP pharmacopeia. Bisoprolol fumarate alone (or) in combined formulation with other drugs is reported to be estimated by HPLC and UV/VIS Spectrophotometric methods. A literature review revealed that no HPLC method has been reported for the estimation of Bisoprolol fumarate in Pharmaceutical formulations individually.<sup>[3,4]</sup>





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Name of Author: Dr. S. N. Nagoba

Name of the Journal: Asian Journal of Pharmaceutical Research and Development

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Asian Journal of Pharmaceutical Research and Development, 2018; 6(4): 81-85

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Research Article

**FORMULATION AND EVALUATION OF DISPERSIBLE PELLETS OF *LAGENARIA SICERARIA***Dudhamal S.S.<sup>1\*</sup>, Kawtikwar P. S.<sup>2</sup>, Nagoba S.N.<sup>3</sup><sup>1</sup> S.R.T.M.U, Nanded, Maharashtra, India<sup>2</sup> S. N. Institute of Pharmacy, Pusad, Yavatmal, Maharashtra, India<sup>3</sup> Channabasweshwar Pharmacy College, Latur, Maharashtra, India**ABSTRACT**

*Lagenaria siceraria* (Bottle gourd) is a common name in every household. Its medicinal values were identified many years ago, and still people use this plant for many disorders. Extrusion spherization technique was employed for preparation of the pellets, to study the effect of croscarmellose sodium, on it. The pellets were prepared by use of combination of Avicel PH 101 and lactose that indicated good flow properties. The superdisintegrant used was croscarmellose sodium between concentration 2 to 8%, to study the effect of it on the pellets. The superdisintegrant showed low disintegration time at low concentration, while as the concentration of it increased, it extended the disintegration time. Thus, optimum concentration needs to be designed for successful formulation. Batch D3 of 6% croscarmellose sodium concentration showed the requisite characteristic in terms of all the evaluation parameters, with DT up to 50 to 55 seconds. Thus, use of this superdisintegrant alone, but in low concentration, can be helpful, or else combination of this with other superdisintegrants can be approached, or else new superdisintegrants can be tried. Thus, the study indicated the effect of superdisintegrant for formulation of dispersible pellets.

**Keywords:** Extrusion-Spherization, Croscarmellose sodium, *Lagenaria siceraria*, Pellets

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\*Address for Correspondence

Sanjay S. Dudhamal, Department of Pharmaceutics, Maharashtra Polytechnic Institute, Nilanga, Maharashtra, India

**INTRODUCTION**

The use of herbal medicines is increasing day by day. The advantages of these herbs pose greater impact to the health of human beings. There are various approaches for formulating these herbs, and one of the approaches is by converting them into dispersible form, for better patient compliance and quick onset of action. Extrusion spherization is one of the methods for formulating dispersible pellets that encompass various advantages over the other dosage forms. *Lagenaria siceraria* [L.S] is one of the herbs that are widely used, as it poses number of applications, for the health of humans. It is the fruit that has number of properties like cooling, diuretic etc. The juice of this plant is also a medicine, used for many cardiac disorders<sup>1,2</sup>. So, considering this fact, an attempt was made to prepare dispersible pellets for the said plant. The pellets were

prepared by extrusion spherization technique, by use of superdisintegrants.

**MATERIALS AND METHODS**

The plant material was purchased from local market. Avicel PH 101 was purchased from Neets Chemicals. PVP K-25 was purchased from Himedia Laboratories Pvt. Ltd. Mumbai, Maharashtra, India. Croscarmellose sodium (Ac-di-Sol) was obtained from Signet Chemical Corporation, Mumbai

**Plant collection:** *Lagenaria siceraria* [L.S] that was collected from local market, was authenticated from Botanical survey of India (BSI), BSI/WRC/Tech/2014 dated 20/11/2014

**PHYTOCHEMICAL ANALYSIS OF *LAGENARIA SICERARIA***<sup>3,4,5</sup>

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Kava Road, Basweshwar Chowk, Latur-413512 (Maharashtra)

Phone No. (02382) 240192, Fax-(02382) 243855

Email- channabasweshwar@gmail.com Website- www.cdphl.org

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Research Article

**FORMULATION AND EVALUATION OF ELIXIR OF  
GYMNEMA SYLVESTRE BY USING LEAF EXTRACT**Khurde Sonali S.<sup>1</sup>, Nagoba Shivappa N.<sup>1\*</sup>, Moholkar Aparark V.<sup>1</sup>, Hindole Sunil S.<sup>1</sup><sup>1</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.**Abstract:**

In the present research work, the main objective is to formulate and evaluate Elixir of *Gymnema Sylvestre* by using Leaf extract. There are lots of chemical agents available to control and to treat diabetic patients, but total recovery from diabetes has not been reported up to this date. Alternative to these synthetic agents, many herbal plants with hypoglycemic properties are known from across the world. *Gymnema Sylvestre* is an herb native to the tropical forests of southern and central India and Sri Lanka. The medicinal part of the plant is the leaf, which reduces or eliminates the ability to sweetness tastes. *Gymnema sylvestre* leaves are known for several medicinal uses such as antidiabetic, hypolipidemic, stomachic, diuretic, refrigerant, astringent and tonic, the major bioactive constituents of *gymnema sylvestre* are a group of triterpenoid glycosides known as gymnemic acids with gymnemagenin as common aglycone. Which is responsible for its tremendous activity specially its blood glucose lowering capacity. In this studies we have shown that the extract of *gymnema sylvestre* is useful in controlling blood sugar to treat type II diabetes (NIDDM) when *gymnema* leaf extract is administered to a diabetic patient it stimulate the pancreas to increase release of insulin.

The elixirs were prepared by using Sodium Saccharin, Glycerin and Alcohol etc. The elixirs were evaluated for FTIR, Viscosity, PH, Refractive Index, Alcohol Content and Assay. In this preparation of the elixir is going to prepare by the simple solution method. It is a clear, sweetened, hydroalcoholic liquid intended for oral use.

**Keywords:** Elixirs, *Gymnema sylvestre*, Sodium Saccharin, Diabetes, Herbal, Insulin.

\*Corresponding author:

**Dr. Nagoba Shivappa N.**

M. Pharm, Ph.D.

Associate Professor and Head,

Department of Pharmaceutics,

Channabasweshwar Pharmacy College,

Kava Road, Latur-413512, Dist. Latur. (MS)

Tel: (+91)-2382-641008 (O), (+91)-2382-240008(O) Fax: +91-2382-243855

Mobile: +919637908901, +919021067644

E-mail: [nagobashivraj@gmail.com](mailto:nagobashivraj@gmail.com), [nshivraj11@rediffmail.com](mailto:nshivraj11@rediffmail.com)

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*www.ijpsi.org Volume 7 Issue 6 Ver. 1 | June 2018 | PP.01-10*

## **Formulation And Evaluation Of Furosemide Oral Disintegrating Tablets**

Nagoba Shivappa N.<sup>1\*</sup>, Warkari Rajan D.<sup>1</sup>, Shimge Krishna R.<sup>1</sup>, Gaikwad V. M.<sup>1</sup>

<sup>1</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

M. Pharm, Ph.D.

Associate Professor and Head,

Department of Pharmaceutics, Channabasweshwar Pharmacy College, Kava Road, Latur-413512, Dist. Latur. (MS)

\* Corresponding Author: Dr. Nagoba Shivappa N.

**ABSTRACT:** Orally disintegrating tablets (ODTs) are a rapidly growing category of dosage form in the pharmaceutical industry which has received ever-increasing demand during the last decade. They especially find application in target category like geriatrics and pediatrics. There are three main manufacturing methods used for the production of ODTs, namely, freeze drying, molding and compression method. Also, different technologies are routinely used for the manufacturing of ODTs i.e. Orasolv®, Durasolv®, WOWTAB®, Flash tab®, Zydiss®, Quicksolv® and Lyoc® etc. Some methods of manufacturing ODTs are complex, require multiple processes and don't provide all ODTs ideal properties. For example, freeze drying and molding provide very light and porous products which disintegrate very rapidly, but they are expensive and produce fragile products. On the other hand, compression method is the easiest and cost effective method for the production of ODTs. Orally disintegrating tablets containing 20 mg of Furosemide were manufactured using direct compression method. Experiments were evaluated for effects of formulation parameters like type & concentration of diluents, concentration of disintegrating agent and their interactions on Furosemide ODTs properties, and Microcrystalline cellulose, Mannitol were used as diluents of different properties, in addition to croscarmellose sodium (CCS), croscopovidone and the fenugreek powder which was used as a natural superdisintegrant in combination with the synthetic. The obtained results revealed that disintegration time of the optimized ODTs formula (14 sec. to 30 sec). ODTs composed of croscopovidone in combination with natural superdisintegrants 5 % level was chosen as optimized formula, as it showed the lowest disintegration time with the highest drug release up to 97.73%. Furthermore, hardness of the manufactured tablets was not significantly affected by the use of croscopovidone and CCS. Finally, it was concluded that Furosemide oral disintegrating tablets were developed using croscopovidone and Fenugreek powder. These tablets provided low disintegration time and high hardness that are acceptable for ODTs. Thus the present work explores a novel technique of formulating palatable ODTs which gave better balance between disintegration time and hardness of the tablet.

**KEYWORDS:** Orally disintegrating tablet, Superdisintegrants (synthetic, natural), Furosemide.

Date of Submission: 09-07-2018

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### **I. INTRODUCTION**

Recent developments in the technology have prompted scientists to develop orally disintegrating tablets with improved patient compliance and convenience. Orally disintegrating tablets are solid dosage forms that disintegrate rapidly when placed upon the tongue, usually within a matter of seconds. ODTs are intended to disperse, dissolve, or disintegrate quickly in the mouth cavity due to saliva, which results in release of the drug due to rapid absorption of the medium into the tablet core followed by prompt tablet disintegration under the effect of superdisintegrants. Orally disintegrating tablets provide an advantage particularly for pediatric and geriatric populations who have difficulty in swallowing conventional tablets and capsules. Additionally, pediatric patients may suffer from ingestion problems as a result of underdeveloped muscular and nervous Control. Moreover, patients traveling with little or no access to water, limit utility of orally administered conventional tablets or capsules. Rapid disintegration of tablet results in quick dissolution and rapid absorption which provide rapid onset of action. Moreover, drug candidates that undergo pre-gastric absorption when formulated as ODTs may show increased oral bioavailability. It provides good stability, accurate dosing, easy manufacturing, small packaging size, and easy to handle by patients. It is easy to administer for pediatric, geriatric, and institutionalized patients (especially, mentally retarded and psychiatric patients). Many technologies have come up for orally disintegrating tablets like Zydiss, OraSolv, DuraSolv, FlashTab and



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Title of the Paper: Formulation and Evaluation of Medicated Mouth Paint For Oral Thrush

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### Formulation and Evaluation of Medicated Mouth Paint for Oral Thrush

Hindole Sunil S.<sup>1</sup>, Nagoba Shivappa N<sup>1\*</sup>, Shaikh Atiya L.<sup>1</sup>, Shaikh Neha M<sup>1</sup>.

<sup>1</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

<sup>2</sup> Associate Professor and Head, Department of Pharmaceutics, Channabasweshwar Pharmacy College, Kava Road, Latur-413512, Dist. Latur. (MS)

Corresponding author: Dr. Nagoba Shivappa N.

**ABSTRACT:** In the present work is aimed at oral retentive mouth paint preparations were designed and prepared for the effective treatment of oral candidiasis. Voriconazole, a triazole derivative having antifungal activity is chosen as model drug in this study. Voriconazole is used to treat oral candidiasis, which is a common infection in debilitated patients, AIDS patients and in persons who administer immunosuppressive drugs. Oral retentive mouth paints containing 1% Voriconazole with different hydrophilic polymers MC, HEC, NaCMC, PEG, glycerol, sodium citrate were formulated and evaluated for physical appearance, pH, drug content, rheological behaviour, spreadability, and FTIR spectral analysis. In vitro drug release studies were carried out at salivary pH 6.4 using cellophane membrane as barrier. Stability studies were carried out on all prepared formulations at ambient temp (RT),  $30 \pm 1^\circ \text{C}$  at  $65\% \pm 5\% \text{RH}$ ,  $40 \pm 2^\circ \text{C}$  at  $75\% \pm 5\% \text{RH}$  (accelerated temperature) for a span of 3 months and analyzed at different time intervals for drug content, physical appearance, pH, oral retention time and spreadability. All the prepared formulations were found to be stable.

**KEY WORDS:** Oral thrush, Voriconazole, drug release, Stability studies.

Date of Submission: 17-08-2018

Date of acceptance: 31-08-2018

#### I INTRODUCTION

Voriconazole is a triazole antifungal medication, it is generally used to treat serious, invasive fungal infections. These are generally seen in patients who are immunocompromised, and include invasive candidiasis, Oral thrush, invasive aspergillosis, and certain emerging fungal infections<sup>1</sup>.

Oral thrush /candidiasis is a disorder caused by infection of the mouth due to fungus (yeast) candida albicans. Chronic thrush may develop, affecting the roof of the mouth in people who wear dentures. They are viscous preparations of medicaments for local action in the oral cavity. Glycerine as base is used because of its viscosity prevents it being washed away rapidly by saliva and thus a prolonged action may be obtained. They are applied in the mouth with a soft brush. The mouth paints are used in treatment of inflammation of various areas of the mouth and throat, which includes stomatitis, pharyngitis, laryngitis and tonsillitis. The common ingredients used in mouth and throat paint are anti infective agents like phenol iodine, gentian violet, boric acid and astringents like tannic acid for treatment of pharyngitis and tonsillitis. The Voriconazole mouth paints are flavoured medicated dosage forms intended to be sucked and hold in mouth and throat. The formulation is applied with brush in throat and patient is counselled for not to drink water immediately after application. The present investigation is designed to improve patient compliance. These preparations are commonly used for the purpose of local or systemic effects through the buccal mucosa. The present work is aimed at preparing a formulation of Voriconazole mouth paint which provide localized action and for protracted period of time to successfully treat oral candidiasis.

#### II OBJECTIVES:

The present work, it is planned to Formulate and Evaluate mucoadhesive mouth paints to treat oral candidiasis / thrush.

- Glycerin based formulation give soothing action in oral cavity with added advantage of sweetening agent with a flavour.
- MC, NaCMC, PEG, EC etc will be used as mucoadhesive polymers to enhance the transit time of formulation in oral cavity.
- Ease of administration, no skilled person is required for application. Brush is provided for applying the drug in mouth which prevents the contamination.



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**Title of the Paper:** Formulation and Evaluation of Medicated Nail Patches for the Treatment of Onychomycosis

**Name of Author:** Dr. S. N. Nagoba

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### **Formulation and Evaluation of Medicated Nail Patches for the Treatment of Onychomycosis**

Gaddime Sonali B.<sup>1</sup>, Nagoba S. N.<sup>1\*</sup>, Patterwar Shraddha G.<sup>1</sup>, Wadulkar R.D.<sup>1</sup>, Thonte S. S.<sup>1</sup>.

<sup>1</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

\* Corresponding Author : Dr. Nagoba S. N.

Associate Professor and Head, Department of Pharmaceutics,  
Channabasweshwar Pharmacy College, Kava Road, Latur-413512, Dist. Latur. (MS)

**ABSTRACT:** The oral therapies encounter side effects and topical therapies for nail diseases are limited by poor permeability of nail plate. An optimal penetration enhancer would improve drug delivery through nail plate facilitating new possibilities for treating neighboring target sites if the systemic circulation is reached. The present investigation aims to formulate and evaluate of medicated nail patches for the treatment of diseases like Onychomycosis (fungal infection of nail) and psoriasis, Yellow nail syndrome, Paronychia and many others. The objective of study to explore the difficulties in penetration of drug across nail patches and to enhance bioavailability of antifungal drugs. Nail drug delivery system is used to reduce such a hazardous systemic effects and provides longer contact time at a site of action. Many formulation of clotrimazole were prepared by using optimized formula which shows better diffusion and permeation. These are evaluated for various parameters including in-vitro release (Diffusion) studies in 7.4 pH phosphate buffers. Effects of varying concentration of various excipients were studied. The evaluation of that patches is carried out by drug excipient interactions subjected to FTIR Spectral analysis, in-vitro diffusion studies, drug content analysis, NDDS is used to achieve maximum therapeutic effect along with improve patient's compliance.

**KEY WORDS:** Clotrimazole, Medicated nail patches, Onychomycosis.

Date of Submission: 21-05-2018

Date of acceptance: 05-06-2018

#### **I INTRODUCTION**

The transungual drug delivery system in this system Trans means through and unguis means nail. Nail plate is responsible for penetration drug across it. Hence transungual drug delivery system is a system associated with drug delivery across nail barrier to achieve a targeted drug delivery to treat fungal nail diseases. Onychomycosis (also known as "ringworm of the nail, and Tineaungulum") is the infection of the nail. Two main diseases affect the nail unit one is onychomycosis and second one is psoriasis. Treatment of these two diseases usually leads to poor patient compliance. Nail fungal infection treatment are difficult to treat effectively because of insufficient concentration reach to the site of action. The main advantages of nail patches i.e., Patient will not feel like as medication, easily removed when needed and Improved patient compliance. For making the nail fungal infection treatment more effective we tried to make a transungual formulation for the treatment with effective penetration enhancer like as:

- (1) Keratolytic enhancers  
Eg: Urea, Salicylic acid, Thioglycolic acid
- (2) Keratinolytic enzymes
- (3) Compound containing sulfahydryl groups  
Eg: Acetylcystein, cysteine,mercaptoethanol.



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Title of the Paper-Formulation and evaluation of oral fast dissolving film of gabapentin by QBD approach

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**FORMULATION AND EVALUATION OF  
ORAL FAST DISSOLVING FILM OF GABAPENTIN BY QBD APPROACH**Bhusnure O.G.<sup>1\*</sup>, Yeote N.S.<sup>1</sup>, Shete R.S.<sup>1</sup>, Gholve S.B.<sup>1</sup>, Giram P.S.<sup>2</sup><sup>1</sup>Department of Quality Assurance, Channabasweshwar Pharmacy College (Degree), Latur (MS), India.<sup>2</sup>Department of Pharmacology, Channabasweshwar Pharmacy College (Degree), Latur (MS), India.\*Corresponding Author Email: [omprakashbhusnure@gmail.com](mailto:omprakashbhusnure@gmail.com)**ABSTRACT**

**Objective:** The objective of the present investigation was to formulate, evaluate and optimize oral film of Gabapentin using experimental design (Box Behnken). **Methods:** Oral films of Gabapentin were formulated using HPMC E15 premium polymer as a film forming agent and propylene glycol as plasticizer and tween 80 as surfactant. The drug & excipients were characterized as per USP 2014. Oral dissolving films were prepared by solvent casting method and were optimized by using box behnken design (A three factor, two level). Formulations were prepared using three independent variables namely polymer quantity( $X_1$ ), Plasticizer( $X_2$ ) and surfactant concentration( $X_3$ ), whereas disintegration time ( $Y_1$ ) and % drug release ( $Y_2$ ) as dependent variables. The formulations were prepared by solvent casting technique and were evaluated for in vitro dissolution studies. The stability studies of the films were performed for optimized batch as per ICH guideline. From the results of design batches, best batch was selected and evaluated for In-Vivo pharmacokinetic study in albino rat model. **Results:** Box Behnken Design using Design Expert Software was used to optimize and evaluate the main effects, interaction effects and quadratic effects of the formulation ingredients on the disintegration time & in vitro drug release. Films were characterized such as thickness, weight variation, appearance content uniformity, folding endurance, surface pH, in-vitro drug release, films were found to be satisfactory when evaluated for all parameters of the films was found to be neutral. The designs establish the role of the derived polynomial equation and contour plots in predicting the values of dependent variables for the preparation and optimization and examined In-Vivo study. The optimized batch is passed the accelerated stability studies. The statistically optimized formulation was characterized with UV, FT-IR (Fourier transformation-infrared spectroscopy) and DSC (differential scanning calorimetry) studies and found no chemical interactions between drug and polymer. **Conclusion:** in salivary pH the prepared fast dissolving films of Gabapentin could be a better alternative for achieving rapid oral bioavailability in treatment of neuropathic pain.

**KEY WORDS**

Oral Film, Gabapentin, Box Behnken Design and Solvent Casting Technique, in-vivo study.

**INTRODUCTION:**

Gabapentin was first approved for use in 1993. The wholesale price is about US\$ 1.35 per day. In the United States it has been available as a generic medication since 2004. As of 2015, the cost for a typical month of medication in the United States is US\$100 to

US\$200. During the 1990s Parke-Davis, a sub-company of Pfizer used a number of techniques to encourage physicians in the United States to use gabapentin for unapproved uses.<sup>1</sup>

Gabapentin, marketed under the brand name Neurontin among others, is a medication used to







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Email- channabasweshwar@gmail.com Website- www.cdphl.org

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**Title of the Paper:** Formulation and Evaluation of Oral Fast Dissolving Sublingual Film of Propranolol HCl

**Name of Author:** Mr. S. B. Gholve

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### Original Article

## Formulation and Evaluation of Oral Fast Dissolving Sublingual Film of Propranolol HCl

Sachin Gholve \*, Sonali Savalsure, Omprakash Bhusnure, Sandeep Surywanshi, Mahesh Birajdar

Channabasweshwar Pharmacy College (Degree), Kava Road, Basweshwar Chowk, Latur, Maharashtra, India-413512

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#### ABSTRACT

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**Objective:** The objective of the present investigation was to formulation & evaluation of oral fast dissolving sublingual film of Propranolol HCl.

**Methods:** In the present investigation an attempt was made to develop fast dissolving sublingual film of propranolol HCl by using two polymers. Fast dissolving films of propranolol HCl were formulate using HPMC E15 & HPMC as a film forming agent and propylene glycol as plasticizer and Cross povidone as a disintegrating agent. Fast dissolving film was prepared by solvent casting method. The stability studies of the patch were performed for optimized batch as per ICH guideline. From the results of design batches, best batch was selected and evaluated for *in vivo* pharmacokinetic study in male/female Wistar rat model using optimized formulation F4 and observed that the excellent drug release in blood of the rat. The drug & excipients were characterized as per IP Drug and excipients studies using FT-IR. **Results:** Films were subjected to physicochemical characterization such as weight variation, thickness, tack test, drug content uniformity, surface pH, folding endurance, disintegration time, *in vitro* drug release, *in vivo* drug release, stability study. Among all the formulations (F1 to F13) prepared, batches F4, F5, F11 & F13 was the best formulation & released 109.86%, 104.73%, 97.74% & 100% in 10min. The statistically optimized formulation was characterized with FT-IR (Fourier transform-infrared spectroscopy) studies and found no chemical interactions between drug and polymer.

**Conclusion:** Thus the prepared fast dissolving film of propranolol HCl could be a better alternative for tablet and capsules an achieving rapid oral bioavailability in treatment of migraine prophylaxis.

**Keywords:** Fast dissolving sublingual film, Propranolol HCl, solvent casting method, Drug release, Fast onset of action.

### 1. INTRODUCTION

The oral route is the most preferred route of administration for systemic effect. About 60% of all the formulations are solid dosage form. Tablet is the most preferred dosage form due to ease of transportation, manufacturing and more patient compliance. Generally geriatric, pediatric and bedridden patient experience difficulties in swallowing the conventional oral dosage form. To overcome this problem a

#### Corresponding author \*

Mr. Sachin Gholve,  
Department of Quality Assurance,  
Channabasweshwar Pharmacy College (Degree),  
Latur, Maharashtra  
Email: sbgholve@gmail.com

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Email- channabasweshwar@gmail.com Website- www.cdphi.org

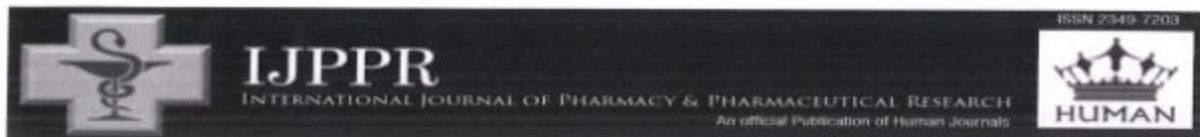
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**Title of the Paper:** Formulation and Evaluation of Transdermal Patches of Nicorandil by Using Different Penetration Enhancer

**Name of Author:** Dr. S. N. Nagoba

**Name of the Journal:** International Journal of Pharmacy and Pharmaceutical Research



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### Formulation and Evaluation of Transdermal Patches of Nicorandil by Using Different Penetration Enhancer

**Bondar Ganesh H.<sup>1</sup>, Nagoba Shivappa N.<sup>1\*</sup>, Sarukh Vikram S.<sup>1</sup>, Shaikh Nasheer S.**

<sup>1</sup>Channabasweshwar Pharmacy College, Latur,  
Maharashtra, India.

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**Keywords:** Matrix-type transdermal patches, Nicorandil, Ethyl cellulose 7-cps, Eudragit RS 100, Penetration Enhancer.

#### ABSTRACT

The purpose of this research was to develop a matrix-type transdermal patch containing drug Nicorandil with different ratios of Ethylcellulose 7 Cps and Eudragit Rs 100 polymeric systems by the solvent evaporation technique by using diethyl phthalate to the polymer weight, incorporated as a plasticizer. To enhance the permeation of drug through the skin by using different types of penetration enhancer like as DMSO, DMF, and Oleic acid are utilized. The prepared matrix patches were evaluated for their physicochemical characterization followed by weight variation, drug content estimation, folding endurance, moisture uptake, moisture loss, FTIR, and *in vitro* diffusion studies. The *in vitro* diffusion release study from different transdermal patches across the dialysis membrane. The polymer concentration of (Ethyl cellulose 7 Cps: Eudragit RS 100) w/w in each type of as polymer Patch was found to be best. As the polymer concentration increase to be used 1:1 w/w, 2:1 w/w, 3:1 w/w ratio. Ethyl cellulose in the concentration of 1% showed the best release as compared to other concentrations.



*AKA*  
**Principal**  
Channabasweshwar Pharmacy College (Degree)  
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## RESEARCH ARTICLE

FORMULATION, DEVELOPMENT AND EVALUATION OF MICROEMULGEL FOR  
TOPICAL APPLICATION

Mandurke Arjun, D., \*Nagoba Shivappa, N., Wadulkar Raganath, D. and Vijayendra Swamy, S. M.

Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur, Maharashtra, India

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## Key words:

Microemulgel,  
Econazole nitrate, Carbopol 940,  
HPMC, Penetration Enhancer.

## ABSTRACT

The aim of the present investigation was to develop and evaluate Econazole nitrate Microemulgel for a treatment of fungal infection. Microemulgel is isotropic mixtures of oil, water and emulsifying agent. Recently, Microemulgel has emerged as one of the most interesting topical preparation in the field of pharmaceutical sciences. The use of Microemulgel as a delivery system has several advantages such as ease of administration, increased residence time of drug at applied site, better drug release, good thermodynamic stability & higher transdermal permeability over conventional formulation. The objective of the study was to prepare Microemulgel of Econazole nitrate, using Carbopol 940 and HPMC [9004-65-3] as a gelling agent, oil phase, preservative, emulsifying agent and buffers was used as penetration enhancer. The prepared Microemulgel formulation was inspected visually for appearance, spreadability, homogeneity, phase separation, viscosity, pH, and Formulations were tested for drug excipient interactions subjecting to FTIR Spectral analysis and In-vitro drug diffusion studies showed 98.24% for F7 formulation maximum release of drug in 120 minutes. Topical antifungal treatment was successfully achieved with Econazole nitrate microemulgel.

Citation: Mandurke Arjun, D., Nagoba Shivappa, N., Wadulkar Raganath, D. and Vijayendra Swamy, S. M., 2018. "Formulation, development and evaluation of microemulgel for topical application". *Asian Journal of Science and Technology*, 10, (09), 8574-8580.

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## INTRODUCTION

There are many types of drug delivery systems that have been developed. The formulation and development of novel drug delivery system with the nature of enhancing the effectiveness of existing of drug is an ongoing process in pharmaceutical research. The concept of microemulsions was first introduced by Hoar and Schulman during 1940s. While microemulgel is the combined form of microemulsion and gel have advantage of both. In recent year the focus of pharmaceutical researches gradually shifting to the development of drug delivery systems rather than finding newer chemical entities for an around improve mentation drug therapy. Over the last decades the treatment of illness has been carry out by administrating drug to human body via various routes namely oral, sublingual, rectal parental etc. when these systems are fail to administration of drug that time use topical drug delivery system. Topical drug delivery system define as the application of drug containing formulation directly to the skin to treat cutaneous disorder with the intent of containing the pharmacological or other effect of the drug to the surface of the skin. Now a day's scenario pharmaceutical researches work is focused to fulfill the therapeutic needs of patients. Most widely used drugs when given by oral route have side

effects like gastric irritation, nausea, bleeding in gastrointestinal tract etc. In order to minimize such side effects and systematic toxicities and also achieve better therapeutic effects one of the promising method is to administered drug via skin or, in short by topical drug delivery system. Gels as topical drug delivery system possess a number of advantages like ease of application, less greasy and easily removed. In spite of many advantages of gels a major limitation is in the delivery of hydrophobic drugs. So to overcome this limitation microemulgel are prepared and with their use even a hydrophobic drug can enjoy the unique properties of gel. Microemulgel are the combination of microemulsion and gel. In recent years there has been great interest in the use of novel polymers with complex functions as emulsifiers and thickeners because the gelling capacity of these compounds allows the formulation of stable emulsions and creams by decreasing surface and interfacial tension and at the same time increasing the viscosity of the aqueous phase. In fact, the presence of a gelling agent in the water phase converts a classical microemulsion in to a microemulgel. Both oil-in-water and water-in-oil emulsions are extensively used as vehicles to deliver various hydrophilic as well as hydrophobic drugs to the skin in microemulgel formulation. They similarly have capability to dissolve drug and to penetrate the skin. Oil-in-water emulsions are mostly useful as water washable drug formulations and for general cosmetic purposes, while water-in-oil emulsions are employed more widely for the treatment of dry skin and emollient application. Gel formulations are generally

\*Corresponding author: Nagoba Shivappa, N.,  
Department of Pharmaceutics, Channabasweshwar Pharmacy College, Latur,  
Maharashtra, India.

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LATUR



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Email- [channabasweshwar@gmail.com](mailto:channabasweshwar@gmail.com) Website- [www.cdphl.org](http://www.cdphl.org)

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**Title of the Paper:** Hepatoprotective activity of ethanolic extract of *gardenia resinifera* roth. Leaf in  $CCl_4$  induced hepatotoxicity

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Research Article

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### HEPATOPROTECTIVE ACTIVITY OF ETHANOLIC EXTRACT OF GARDENIA RESINIFERA ROTH. LEAF IN $CCl_4$ INDUCED HEPATOTOXICITY

Hindole S. S.<sup>\*1</sup>, Kusum Akki<sup>2</sup>, M. S. Attar<sup>3</sup>, M. J. Birajdar<sup>3</sup>, A. V. Moholkar<sup>3</sup> and  
V. B. Panchbhai<sup>3</sup>

<sup>1</sup>HOD of Department of Pharmacognosy and Phytochemistry, Channabasweshwar Pharmacy  
College, Latur, Maharashtra, India.

<sup>2</sup>Dept. of Pharmacognosy and Phytochemistry, KLE's College of Pharmacy, Hubli,  
Karnataka, India.

<sup>3</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra, India.

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#### \*Corresponding Author

**Dr. Hindole S. S.**  
HOD of Department of  
Pharmacognosy and  
Phytochemistry,  
Channabasweshwar  
Pharmacy College, Latur,  
Maharashtra, India.

#### ABSTRACT

The liver disorders are the dangerous problems of the world. The increase in the levels of serum SGOT, SGPT and ALP observed in the positive control group is an indication of the extensive hepatotoxicity induced by  $CCl_4$ . The aim of this study was to test the efficacy of ethyl acetate as well as ethanolic extract of *Gardenia Resinifera* Roth. in  $CCl_4$  induced hepatotoxicity. Administering ethanolic extract of *Gardenia Resinifera* Roth. (400 mg/kg, p.o.) significantly ( $p < 0.001$ ) reduced the levels of serum SGOT, SGPT, ALP and Bilirubin (Total & Direct) in  $CCl_4$  induced hepatotoxicity as compared to the animals treated with  $CCl_4$  treated group alone. This extract also improve the histology of liver. From the present investigations, it can be concluded that the ethanolic extract of leaves of *Gardenia Resinifera* Roth.

possessing hepatoprotective effect which may be due to antioxidant potential of flavonoids that present in it.

**KEYWORDS:**  $CCl_4$ -Hepatotoxicity, Enzyme kits, Liver histology, *Gardenia Resinifera* Roth. Hepatoprotective etc.

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**Title of the Paper:** Attenuation of neuropathic pain by Lacosamide in an experimental model of chronic constriction injury in Rats

**Name of Author:** Ms. P. S. Giram

**Name of the Journal:** International Journal of Pharmacy and Biological Sciences



## ATTENUATION OF NEROPATHIC PAIN BY LACOSAMIDE IN AN EXPERIEMENTAL MODEL OF CHRONIC CONSTRICTION INJURY IN RATS

Giram Padmaja S.\*, Upasani Chandrashekhar D., Bhusnure Omprakash.G.  
School of Pharmacy, Department of Pharmacology, SRTMU, Nanded (MS), India.

\*Corresponding Author Email: varshagiram@gmail.com

### ABSTRACT

**Aim:** The aim of the present study was to investigate effect of lacosamide (LCM) in chronic constriction injury of sciatic nerve by behavioral evaluation in rats. **Methods:** Chronic constriction injury (CCI) was induced by placing four loose ligatures around the sciatic nerve proximal part of the trifurcation with an approximate distance of one millimeter between each ligature. The mechanical hyperalgesia, cold allodynia, thermal hyperalgesia were evaluated by performing pin prick test & von frey filament; acetone drop; hot plate respectively. Rats were treated daily with lacosamide (5, 15 and 45 mg/kg i.p.) from the day of surgery (day 0) for 14 days in comparison with the positive control drug used (Pregabline 10mg/kg, i.p.). Chronic constriction injury was associated with the development of mechanical hyperalgesia, cold allodynia, heat hyperalgesia along with an assessment of spontaneous pain and postural index of foot deformity. **Result:** In the present study, we investigated the antiallodynic and antihyperalgesic properties of lacosamide, in chronic constriction injury (CCI)-induced neuropathic pain rat model. Our findings showed that single and repeated dose of intra-peritoneal administration of lacosamide (5, 15, 45 mg/kg) significantly inhibited ( $P < 0.05$ ) the chronic constriction injury induced neuropathic pain in dose dependent manner. Lacosamide showed ameliorating action against CCI induced neuropathic pain in all the tested models as the behavioral score of neuropathic pain. **Conclusion:** The results indicated that lacosamide significantly attenuated CCI-induced neuropathic pain. It may be concluded that the anti-nociception mediated by lacosamide are responsible for its beneficial effects in neuropathic pain in rats. Therefore, the present study suggests the potential use of lacosamide in the treatment of neuropathic pain, which merits further clinical investigation.

### KEY WORDS

Chronic Constriction Injury (CCI), Neuropathic pain, Lacosamide, Behavioral study, Anti-nociceptive.

### 1. INTRODUCTION

Up to one in four patients with diabetes may be affected by chronic diabetic painful neuropathy (DPN)<sup>1-2</sup> and suffer substantial morbidity and impaired quality of life.<sup>3</sup> Because the current treatment options are limited, there is continued need for new therapeutic approaches.<sup>3,4</sup>

The International Association for the Study of Pain defines neuropathic pain as "initiated or caused by a primary lesion or dysfunction in the nervous system"

and defines neuropathic due to disordered peripheral or central nerves. Neuropathic pain is not a single entity; it is a heterogeneous group of conditions that differs in not only aetiology, but also in location, and symptoms respect neither cause nor anatomical site. Neuropathic pain is generally characterized by sensory abnormalities such as unpleasant abnormal sensation (dysaesthesia), an increased response to painful stimuli (hyperalgesia), and pain in response to a stimulus that does not normally provoke pain (allodynia).<sup>5-7</sup>





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**Name of the Journal:** Journal of Microencapsulation

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## Multiple response optimisation of processing and formulation parameters of pH sensitive sustained release pellets of capecitabine for targeting colon

Sonia Pandey ✉ S. M. Vijayendra Swamy, Arti Gupta, Akshay Koli, Swagat Patel, Furqan Maulvi & ...show all  
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### Abstract

**Purpose:** To optimise the Eudragit/Surelease®-coated pH-sensitive pellets for controlled and target drug delivery to the colon tissue and to avoid frequent high dosing and associated side effects which restrict its use in the colorectal-cancer therapy.

<https://www.tandfonline.com/doi/abs/10.1080/02652048.2018.1465138> Code=imnc20



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Principal  
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**Title of the Paper:** Pharmacognostic and phytochemical evaluation of leaves of gardenia resinifera roth

**Name of Author:** Mr. S. S. Hindole

**Name of the Journal:** International Journal of Pharmacognosy



**PHARMACOGNOSTIC AND PHYTOCHEMICAL EVALUATION OF  
LEAVES OF GARDENIA RESINIFERA ROTH**

Hindole S. S.<sup>1\*</sup>, Kusum Akki<sup>2</sup>, M. S. Attar<sup>3</sup>, S. R. Suryawanshi<sup>3</sup>, N. S. Shaikh<sup>3</sup>,  
S. G. Zingade<sup>3</sup>

<sup>1</sup>HOD of Department of Pharmacognosy and Phytochemistry, Channabasweshwar Pharmacy  
College, Latur, Maharashtra India.

<sup>2</sup>Dept. of Pharmacognosy and Phytochemistry, KLE's College of Pharmacy, Hubli,  
Karnataka, India.

<sup>3</sup>Channabasweshwar Pharmacy College, Latur, Maharashtra India.

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**\*Corresponding Author**  
**Hindole S. S.**  
HOD of Department of  
Pharmacognosy and  
Phytochemistry,  
Channabasweshwar  
Pharmacy College, Latur,  
Maharashtra India.

**ABSTRACT**

*Gardenia resinifera Roth.* is a medicinal plant belonging to family Rubiaceae. It is an important traditional medicinal plant employed in various indigenous system of medicine against several diseases. The current communication provides Pharmacognostic, physicochemical & phytochemical investigation carried out on the leaves of *Gardenia resinifera Roth.* Which are useful in setting some diagnostic indices for the identification and preparation of a monograph of the plant.

**KEYWORDS:** *Gardenia resinifera* Roth. Pharmacognostic study, physicochemical study, phytochemical analysis, leaves etc.

**INTRODUCTION**

Gardenias are members of the madder, or Rubiaceae family. Gardenias are most prevalent in China, Japan, tropical regions of Southeast Asia and the Pacific islands, South Africa and India. Today there are over 200 different species of gardenia mostly hybrid in existence throughout the world.

*Gardenia resinifera Roth.* Is commonly known as dikamali which belongs to the family Rubiaceae. It is a large glabrous shrub or small tree attaining a height upto 6-7.5 m high and found in different Hills & Ghati areas of India. Different parts of this plant contains different



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**Title of the Paper:** Diosmin Phytosomes: Development, Optimization and Physicochemical Characterization**Name of Author:** Dr. O. G. Bhusnure**Name of the Journal:** Indian Journal of Pharmaceutical Education and Research

Original Article

## Diosmin Phytosomes: Development, Optimization and Physicochemical Characterization

Prachi P Udapurkar\*, Omprakash G Bhusnure, Santosh R Kamble

School of Pharmacy, Swami Ramanand Teerth Marathwada University, Nanded – 431606, Maharashtra, INDIA.

### ABSTRACT

**Background:** Diosmin is a flavonoids glycoside that possesses different therapeutic activity include vascular-protecting agent used to help improving chronic venous insufficiency (CVI), haemorrhoids, etc. Diosmin is bioactive flavones constituent with wide range of biological activity. The poor solubility and dissolution rate limit its oral absorption and bioavailability. **Aim:** The aim of the present study is to develop diosmin - phospholipid complex (DN-PC) and characterized by physicochemical method. **Method:** DN-PC was prepared by refluxing followed by solvent evaporation technique in different ratios of Diosmin to Phosphatidylcholine. **Physicochemical Characterization:** DN-PC was characterised by various parameters like drug content, solubility studies, particle size determination, infrared absorption (FTIR), Differential scanning calorimetry (DSC), X-ray diffraction (XRD), Scanning electron microscopy (SEM), entrapment efficiency etc. **Results:** SEM and XRD revealed the reduction in crystallinity of diosmin in the phytosomes. FTIR and DSC confirm the formation of phyto-phospholipid complex. **Conclusion:** The results of the study revealed that the phospholipid complex may be considered as a promising drug delivery system that improves the absorption and bioavailability of plant constituents.

**Key words:** Phytosome, Diosmin, Phosphatidyl choline, Characterization.

### INTRODUCTION

The therapeutic uses of phytoconstituents are very popular for health maintenance by various means. Most of the bioactive constituents of plants are polar or water-soluble molecules (e.g. phenolics, glycosides, tannins and flavonoids). However, water soluble phytoconstituents are limited in their effectiveness because they are poorly absorbed due to large molecular size and poor lipid solubility when taken orally or when applied topically.<sup>1</sup>

Flavonoids are beneficially effective for anti-oxidant, anti-inflammatory, antiviral, anti-allergic, anticancer, etc.<sup>2</sup> The chemical structures and physicochemical properties of flavonoids verify their rate and extent of absorption. The biological activities of flavonoids depend on their bioavailability. The very limited information is available about bioavailability of flavonoids.<sup>3,4</sup>

Diosmin is flavonoid glycoside that can be isolated from various plant sources or derived from the flavonoid hesperidins.<sup>5</sup> Diosmin is considered to be a vascular-protecting agent used to help improving chronic venous insufficiency (CVI),<sup>6</sup> haemorrhoids, lymphedema, and varicose veins.<sup>7</sup> As a flavonoid, diosmin also exhibits anti-inflammatory,<sup>8</sup> free-radical scavenging,<sup>9</sup> antidiabetic<sup>10</sup> and antimutagenic properties.<sup>11</sup> The diosmin is practically insoluble in water.<sup>12</sup> Thus the dissolution rate of diosmin is limiting its absorption from the gastrointestinal tract. An attempt was made to increase the oral bioavailability of the drug chiefly centred on particle size reduction. The rate and extent of dissolution of diosmin was increase by nano sizing which led directly to an increase oral bioavailability which in turn enables dosage reduction.

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Correspondence:

Prachi P. Udapurkar,  
Research Scholar School  
of Pharmacy, Swami  
Ramanand Teerth  
Marathwada University,  
Nanded - 431606,  
Maharashtra, INDIA.  
Phone: +919423113050  
E-mail: [prachi.udapurkar@gmail.com](mailto:prachi.udapurkar@gmail.com)

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Phone No. (02382) 240192, Fax-(02382) 243855

Email- [channabasweshwar@gmail.com](mailto:channabasweshwar@gmail.com) Website- [www.cdphl.org](http://www.cdphl.org)

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ज्ञान-विज्ञान विमुक्तये  
[UGC Approved Journal]**EFFECT OF LACOSAMIDE IN STREPTOZOTOCIN-INDUCED  
DAIBETIC NEUROPATHIC PAIN**

Giram Padmaja S. \*, Upasani Chandrashekhkar D., and Bhusnure O. G

School of Pharmacy, Department of Pharmacology, SRTMU, Nanded (MS), India.

\*Corresponding Author Email: [varshagiram@gmail.com](mailto:varshagiram@gmail.com)**ABSTRACT**

**Objective:** Objective of the present study was to investigate anti-nociceptive effect of lacosamide in STZ-induced diabetic rats. **Material & Methods:** Antinociceptive effect of lacosamide (5, 15 & 45 mg/kg body weight i.p.) was evaluated in the STZ-induced diabetes rat model (Streptozotocin 55 mg/kg i.p.) in total different five groups. Eddy's hot plate and tail immersion test were performed on 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> weeks (On day 0, day 7, day 14, day 21 and day 28) of experiment to assess thermal hyperalgesia and cold allodynia respectively. Thermal allodynia evaluated by hot plate (at 45°C±0.50C); Thermal hyperalgesia evaluated (at 55°C±0.5°C) and tail emersion (Cold water 10°C±0.5°C and hot water 55°C±0.5°C) method; and rota rod test was conducted to examine motor function and also tail flick and pin prick methods as measures of neuropathic pain. Further the dose-dependent improvement was observed in thermal hyperalgesia cold allodynia. **Results and Conclusion:** A significant degree of thermal (Allodynia and hyperalgesia) and mechanical hyperalgesia ( $p \leq 0.05$ ) was produced in all the treatment animal groups. There was also decrease in the grip strength in diabetic rat which indicates induction of neuropathy or nerve damage. The result of the present study indicates that the lacosamide demonstrate that significant ( $p < 0.05$ ) antiallodynic and antihyperalgesia effects on STZ-induced diabetic rats. Lacosamide increase the grip strength, licking time, withdrawal latency and loss of pain perception, prevention of nerve damage in treatment demonstrates its protective effect in diabetic neuropathy. **Conclusion:** Lacosamide was effective in reducing both the thermal and mechanical hyperalgesia means it has shown good efficacy in different models of STZ induced neuropathic pain.

**KEY WORDS**

STZ- Diabetic Neuropathy, Lacosamide, Behavioural Methods, Antinociceptive

**INTRODUCTION**

Pain is defined as an unpleasant sensation and emotional experience associated with actual or potential tissue injury. Everyone at some point has experienced a painful sensation. Pain can cause unwanted physical, emotional and social anguish throughout one's daily life

Painful diabetic neuropathy (PDN) is one of the leading causes of neuropathic pain in humans.<sup>1,3</sup> PDN is a chronic, usually symmetrical sensorimotor polyneuropathy that produces significant morbidity

with negative influence on a patient's general activity. Mood, mobility, work, social relations, sleep and overall quality of life.<sup>1,3</sup> Treatment of PDN is challenging because the mechanism involved are unclear.<sup>4</sup> And the mechanisms of the action for drugs used to treat neuropathic pain have not been fully elucidated. Making it difficult to match the type of pain to the most appropriate medication. Pharmacological agents used in the management of PDN include tricyclic antidepressants, selective serotonin and norepinephrin reuptake inhibitors, opioids, and anticonvulsants.



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**Title of the Paper:** QbD Approach for Analytical Method Development and Validation of Bisoprolol Fumarate By Spectroscopic Method

**Name of Author:** Dr. O. G. Bhusnure

**Name of the Journal:** Indian Journal of Pharmaceutical Education and Research



## QbD APPROACH FOR ANALYTICAL METHOD DEVELOPMENT AND VALIDATION OF BISOPROLOL FUMARATE BY SPECTROSCOPIC METHOD

Bhusnure O. G.<sup>1\*</sup>, Dongare R.B.<sup>1</sup>, Gholve S.B.<sup>1</sup>, Munde Anoop B.<sup>1</sup>, Shette R.S.<sup>1</sup>  
Channabasweshwar Pharmacy College, Dept of Quality Assurance, Latur (MS), India

\*Corresponding Author Email: [omprakashbhusnure@gmail.com](mailto:omprakashbhusnure@gmail.com)

### ABSTRACT

An accurate and reliable ultra-violet spectrophotometric method was developed based on the Quality by Design framework, for determination of Bisoprolol Fumarate oral dosage form. According to International Conference on Harmonization (ICH Q8 [R2]) guidelines, an experimental work was planned for both spectroscopic method development and its validation. QbD (Quality-by-Design) approach was implemented for spectroscopic method development and its validation. The research work demonstrated that the UV is valid for the determination of assay of Bisoprolol fumarate. For performing experimental work analytical grade chemical (water, methanol, chloroform, ethanol) was used the spectroscopic method development and validated on UV spectrophotometer by using suitable solvent (water, methanol, chloroform, ethanol) and detection was performed at 223 nm. Target Product Quality Profile (TPQP) and Critical Quality Attributes (CQA). This is helpful to observe the impact of raw materials Critical Material Attributes (CMA), Critical Process Parameter (CPP) on the CQAs. For all the variable parameters as stated in Ishikawa diagram, the absorbance was recorded over the concentration range.

### KEY WORDS

QbD, Bisoprolol Fumarate, UV spectroscopic method, TPQP, CQA, CMA, CPP, Ishikawa diagram.

### INTRODUCTION

Analytical methods play an important role supporting implementation of QbD in process Pharmaceutical development and development and manufacturing. Analytical testing also plays prominent role in Pharmaceutical development, risk assessment, process monitoring and control and continuous quality assessment throughout the product. Quality-by-Design (QbD) is well-established in development and manufacture of pharmaceutical drug substance and drug product and is discussed in ICH Q8, [1] Q9 and Q2. The same QbD approach can be applied to analytical procedures as per ICH Q2. In addition, there is now a technique to definitively link the data to its intended use. These are exciting times for testing laboratories and the users of the data they produce. This knowledge obtained during development helps to verify the

establishment of a design space, (process) control strategy and set point within the (regulatory approved) design space. Materials made within the design space will produce an acceptable product, and changes within the design space are regulatory acceptable. Quality by Design approach suggests looking into the quality of analytical process during the development stage itself. It says that quality should be built into the process design rather than testing into final results of analytical process. QbD is defined as —a systematic approach to development that begins with predefined objectives and emphasizes product and process understanding based on sound science and quality risk management. In alignment with the approach proposed in the draft FDA guidance for process validation, a three-stage approach can be applied to method validation [2-3].



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**STABILITY INDICATING HIGH PERFORMANCE THIN-LAYER CHROMATOGRAPHY METHOD FOR SIMULTANEOUS ESTIMATION OF AMBROXOL HYDROCHLORIDE AND LORATADINE IN PHARMACEUTICAL DOSAGE FORM**

Sathish R. S.<sup>1\*</sup>, Pankajwar S. S.<sup>2</sup> and Obe S. M.<sup>3</sup>

<sup>1</sup> Department of Pharmaceutical Chemistry, School of Pharmacy, SRTM University, Nanded - 431 806, Maharashtra, India  
<sup>2</sup> For Correspondence: E-mail - sathishr@gmail.com  
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**ABSTRACT**  
A simple, sensitive, accurate, precise and rapid stability indicating HPTLC method for simultaneous determination of ambroxol hydrochloride and Loratadine in pharmaceutical dosage form has been developed. The study was performed on TLC aluminum plates precoated with silica gel 60F<sub>254</sub> using chloroform: methanol (9:1v/v) as the mobile phase. This system gives compact and dense spots for both ambroxol hydrochloride (R<sub>f</sub> value of 0.36±0.003) and loratadine (R<sub>f</sub> value of 0.68±0.002). Densitometric analysis of both drugs was carried out in the reflectance absorbance mode at 216 nm. The coefficient of variation data for the calibration plots showed a good linear relationship with R<sup>2</sup> = 0.997 ± 1.1224 in the range of 600-3600 ng for ambroxol hydrochloride and R<sup>2</sup> = 0.998 ± 0.0935 in the range of 50-300 ng for loratadine. The method was validated according to ICH guidelines for specificity, precision, robustness and recovery. Stability study shows that the chromatograms of samples from its degradation products were well resolved with significant R<sub>f</sub> values.

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