

To

The Principal,
JKK Munirajah Institute of Health Sciences College of Pharmacy,
TN Palayam.

Sub: Request for Funding for Research Project – Reg.

Dear Sir,

I am writing on behalf of **JMS Pharmaceutical Private Limited**, a dedicated entity in the pharmaceutical industry that is constantly striving for innovation and excellence. I am excited to explore the possibility of a collaborative research project with JKK Munirajah Institute of Health Sciences College of Pharmacy, a renowned institution known for its contributions to pharmaceutical research.

We are impressed by the expertise and commitment to academic excellence that your institution represents. It is our belief that by combining the strengths of **JMS Pharmaceutical Private Limited** and JKK Munirajah Institute of Health Sciences College of Pharmacy, we can embark on a research journey that will be both transformative and insightful.

Our interest lies in Drug Formulation for Rheumatoid Arthritis Treatment, an area where we see significant potential for groundbreaking research. We believe that this project aligns perfectly with our mission to drive innovation in pharmaceuticals and contribute valuable insights to our industry.

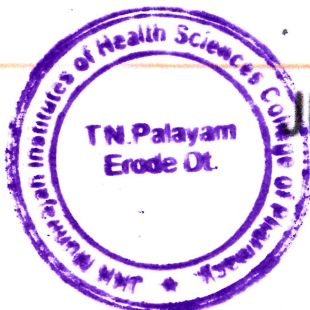
In this context, I kindly request your consideration for a collaborative research effort and potential financial support for the proposed project. We are fully committed to providing the necessary financial resources and any logistical support required to ensure the successful execution of this research endeavor.

We are aware that every collaboration comes with its unique terms and conditions. We are open to discussing and adhering to any specific requirements or standards set by JKK Munirajah Institute of Health Sciences College of Pharmacy. Furthermore, we commit to maintaining the highest standards of reporting and accountability throughout the research process.



Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
605 007, Erode (Dt) - 638 506



JMS Pharmaceutical Private Limited

First floor # 775/14, Tilak Nagar, Attibele, Bangalore - 562 107.

☎ 080 - 3221432 ✉ info@jmspharma.com

www.jmspharma.com



Attached herewith is a detailed project proposal that outlines the project's objectives, methodologies, expected outcomes, and budgetary needs. I kindly request your esteemed institution's review of the proposal, and we would greatly appreciate the opportunity to engage in further discussions about the project's implementation.

We genuinely believe that a collaborative effort between our organization and your institution has the potential to lead to significant advancements in the field of pharmaceutical research. We are enthusiastic about the prospect of working closely with JKK Munirajah Institute of Health Sciences College of Pharmacy and contributing to the growth of knowledge in our field.

Thank you for considering our proposal, and we eagerly await your response. Please do not hesitate to reach out to us at your convenience so that we can begin discussions and explore the potential of this partnership.

Thanking you

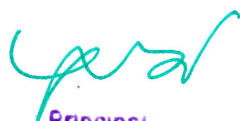




Sincerely,

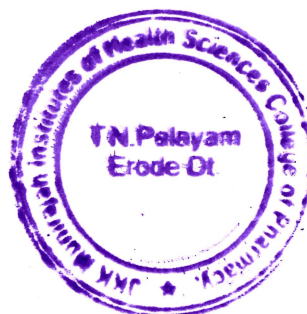
For JMS PHARMACEUTICAL (P) LTD.,

Managing Director



Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



JMS Pharmaceutical Private Limited

First floor # 775/14, Tilak Nagar, Attibele, Bangalore - 562 107.

☎ 080 - 3221432 ✉ info@jmspharma.com

www.jmspharma.com



JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY

(Approved by Tamil Nadu Govt. & Pharmacy Council of India - New Delhi, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai)
Thookanaickenpalayam, Gobichettipalayam (TK), Erode (DT) - 638506, Tamil Nadu.

DR. P. PERUMAL M.Pharm., Ph.D., FIC.,
Professor & Principal

23.08.2021

To

JMS Pharmaceutical Private Limited,
First floor, No. 775/14,
Opp. Syndicate Bank Tilak Nagar,
Sarjapura Rd., Attibele, Anekal Taluk,
Bangalore.

Subject: Response to Your Request for a Second Research Project Collaboration – Reg.

Dear Sir/Madam,

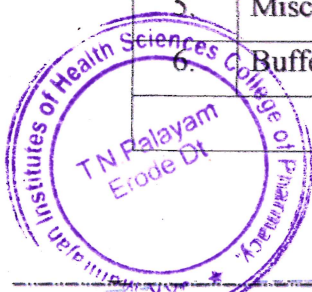
We extend our warmest greetings and express our sincere appreciation for your organization's interest in collaborating with JKK Munirajah Institute of Health Sciences College of Pharmacy on the proposed research project.

We have carefully reviewed your letter and the detailed project proposal attached therein. It is with great enthusiasm and anticipation that we respond to your request, as we believe that this collaboration holds tremendous potential for advancing pharmaceutical research.

Regarding your inquiry about budget and faculty details, we are pleased to provide you with the following information:

Budget Details:

S. No	Detail of Expenditure	Amount in lakhs
1.	Laboratory Equipment and Supplies (Glassware, Instruments)	₹0.30
2.	Raw Materials (Boswellic Acids and Guggulosterones)	₹0.24
3.	Research Personnel (Salaries, Stipends)	₹0.30
4.	Chemicals and Reagents	₹0.15
5.	Miscellaneous Expenses	₹0.15
6.	Buffer (10% of Total Budget)	₹0.16
Total Project Budget		₹1.3 lakhs



[Signature]
Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506

[Signature]
Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506



JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY

(Approved by Tamil Nadu Govt. & Pharmacy Council of India - New Delhi, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai)
Thookanaickenpalayam, Gobichettipalayam (TK), Erode (DT) - 638506, Tamil Nadu.

DR. P. PERUMAL M.Pharm., Ph.D., FIC.,
Professor & Principal



Faculty Details:

The key faculty members who will be actively involved in the project, including the Principal Investigator, are as follows:

1. DR. M. PERIASAMY, Professor, Department of Pharmacology.
2. Dr. S. SATHEESH, Assistant Professor, Department of Pharmacology.
3. Ms. M. REVATHI, Assistant Professor, Department of Pharmacology.
4. Mr. S. DEEPANCHAKKARAVARTHI, Assistant Professor, Department of Pharmacology.

Please feel free to contact me directly at principal@jkkmihsdp.org to coordinate our meeting or address any further inquiries you may have.

Thank you



Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506

Yours Sincerely,

Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



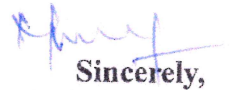
Date: 30.08.2021

JMS Pharmaceutical Private Limited is dedicated to fostering research collaborations with academic institutions and universities. We are pleased to acknowledge the submission of a research project led by DR. M. PERIASAMY, a distinguished researcher and leader within the field. DR. PERIASAMY is associated with the Department of Pharmacology at JKK Munirajah Institute of Health Sciences College of Pharmacy, located in T.N Palayam, Erode. This research endeavor is further enriched by the participation of Dr. S. SATHEESH, Ms. M. REVATHI, Mr. S. DEEPANCHAKKARAVARTHI, serving as Assistant Professors in the Department of Pharmacology, who will actively contribute as co-investigators.

In alignment with our unwavering commitment to the advancement of research, **JMS Pharmaceutical Private Limited** is delighted to announce the approval of a financial grant totaling **Rs. 1,30,000/-** (Rupees One lakh thirty thousand only) to facilitate the seamless execution of the aforementioned research project. We wholeheartedly appreciate the diligent efforts and dedication exhibited by DR. M. PERIASAMY, the Principal Investigator, and the entire research team throughout the lifecycle of the project.

After meticulous scrutiny of the project's final report and financial statements, **JMS Pharmaceutical Private Limited** is pleased to formally grant approval for the disbursement of Rs. 1,30,000 /- (Rupees One lakh thirty thousand only) as financial support for the research project titled "**Formulation and Assessment of Topical Boswellic Acids and Guggulosterones for Rheumatoid Arthritis Treatment,**" led by DR. M. PERIASAMY, a respected leader in the Department of Pharmacology at JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N Palayam.

Thank you


Sincerely,

For JMS PHARMACEUTICAL (P) LTD.,

Managing Director


Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506



JMS Pharmaceutical Private Limited

First floor # 775, 7th Main Road, Attibele, Bangalore - 562 107.

☎ 080 - 3221432 ✉ info@jmspharma.com

www.jmspharma.com



JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY

(Approved by Tamil Nadu Govt. & Pharmacy Council of India - New Delhi, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai)
Thookanaickenpalayam, Gobichettipalayam (TK), Erode (DT) - 638506, Tamil Nadu.

DR. P. PERUMAL M.Pharm., Ph.D., FIC.,
Professor & Principal

PROJECT COMPLETION REPORT

Date: 22/12/2021

To

JMS Pharmaceutical Private Limited,
First floor, No. 775/14,
Opp. Syndicate Bank Tilak Nagar,
Sarjapura Rd., Attibele, Anekal Taluk,
Bangalore.

Subject: Research Project Completion Report – Reg.

Respected Sir/Madam,

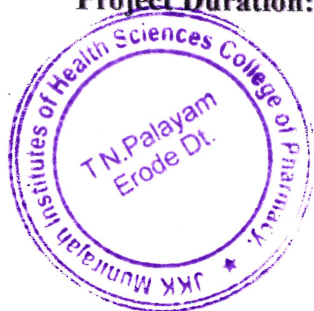
With respect to the above-mentioned subject I, DR. M. PERIASAMY, Principal Investigator, have completed research project, sanctioned under Research Project Scheme for the year 2021-2022.

The audit for the research project has been completed. The details of the completed research project are as follows:

Title of the Project: Formulation and Assessment of Topical Boswellic Acids and Guggulosterones for Rheumatoid Arthritis Treatment

Project Duration: 30.08.2021 – 20.12.2021

Thanking You



Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506

Yours sincerely

Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



LETTER OF APPRECIATION

Dear Principal,

I am writing on behalf of **JMS Pharmaceutical Private Limited** to extend our heartfelt appreciation and gratitude to you and your esteemed institution for the successful completion of the research project titled "Formulation and Evaluation of Topical Formulations of Boswellic Acids and Guggulosterones for Rheumatoid Arthritis Treatment."

This project, led by the exemplary leadership of DR. M. PERIASAMY, Professor in the Department of Pharmacology, reflects the highest standards of dedication, innovation, and scientific rigor. The successful outcomes of this research effort are a testament to the expertise and commitment to excellence demonstrated by DR. PERIASAMY and the entire research team.

We recognize that your institution played a pivotal role in facilitating this research collaboration, providing the necessary resources, infrastructure, and academic guidance. Your unwavering support has not only led to the completion of a significant research milestone but has also contributed to the advancement of knowledge in the field of pharmacology and rheumatoid arthritis treatment.

The impact of this research project extends far beyond the laboratory, as it holds the potential to benefit individuals living with rheumatoid arthritis and contributes to the broader landscape of pharmaceutical research.

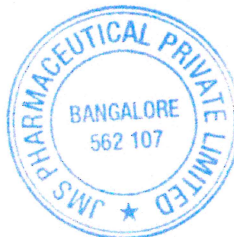
We express our sincere gratitude for your institution's commitment to academic excellence and research innovation. We look forward to the possibility of future collaborations with JKK Munirajah Institute of Health Sciences College of Pharmacy, knowing that together, we can continue to make meaningful contributions to the field of healthcare and pharmaceuticals.

Thank you

Warm regards,

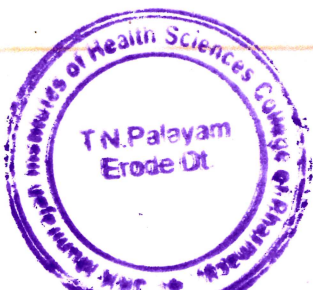
Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



For **JMS PHARMACEUTICAL (P) LTD.**

Managing Director



JMS Pharmaceutical Private Limited

First floor # 775/14, Tilak Nagar, Attibele, Bangalore - 562 107

☎ 080 - 3221432 ✉ info@jmspharma.com

www.jmspharma.com



JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY

(Approved by Tamil Nadu Govt. & Pharmacy Council of India - New Delhi, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai)
Thookanaickenpalayam, Gobichettipalayam (TK), Erode (DT) - 638506, Tamil Nadu.

DR. P. PERUMAL M.Pharm., Ph.D., FIC.,
Professor & Principal

UTILIZATION CERTIFICATE

Certified that the grant of Rs. 1,30,000 /- (Rupees One lakh Thirty thousand only) received from the JMS Pharmaceutical Private Limited, under the scheme of support for Research Project entitled "Formulation and Assessment of Topical Boswellic Acids and Guggulosterones for Rheumatoid Arthritis Treatment" dated 30 August 2021 has been fully utilized for the purpose for which it was sanctioned and in accordance with the terms and conditions laid down by the JMS Pharmaceutical Private Limited.

Date: 20.12.2021

Place: T.N. PALAYAM

Name and Signature of Principal

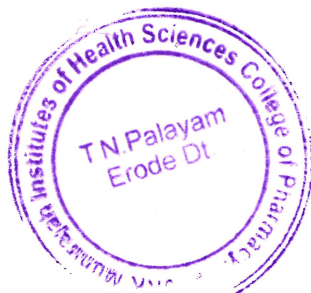
Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506

Name and Signature of Principal investigator

Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506



**“FORMULATION AND EVALUATION OF TOPICAL FORMULATIONS OF
BOSWELLIC ACIDS AND GUGGULOSTERONES FOR RHEUMATOID
ARTHRITIS TREATMENT”**

PRINCIPAL INVESTIGATOR

DR. M. PERIASAMY, M. Pharm., Ph. D.,

Professor,

Department of Pharmacology,

CO-INVESTIGATORS

Dr. S. SATHEESH, Pharm.D.,

Assistant Professor,

Department of Pharmacology,

Ms. M. REVATHI, M. Pharm.,

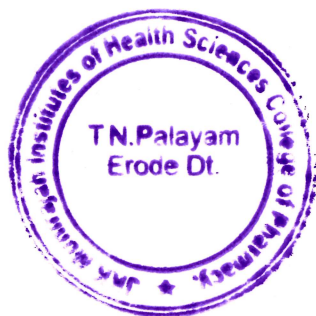
Assistant Professor,

Department of Pharmacology,

Mr. S. DEEPANCHAKKARAVARTHI, M. Pharm.,

Assistant Professor,

Department of Pharmacology,



Principal

**JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506**

DECEMBER-2021

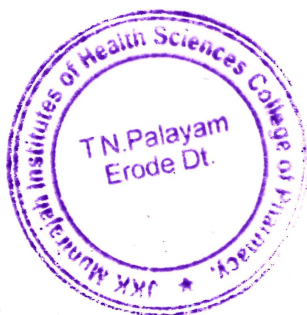
**JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES
COLLEGE OF PHARMACY,
T.N-PALAYAM-638506, GOBI (TK), ERODE (DT),
TAMILNADU.**

CERTIFICATE

This is to certify that the Research entitled “**FORMULATION AND EVALUATION OF TOPICAL FORMULATIONS OF BOSWELLIC ACIDS AND GUGGULOSTERONES FOR RHEUMATOID ARTHRITIS TREATMENT**” submitted to The **JMS Pharmaceutical Private Limited**, is the bonafide project work carried out in the Department of Pharmacology, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode, Under the guidance of **DR. M. PERIASAMY, M. Pharm., Ph. D., Professor, Department of Pharmacology, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N Palayam, Gobi, Erode.** During the academic year 2021-2022.

Place: T.N-Palayam

Date: 20.12.2021



Dr. P. Perumal. M.Pharm, Ph.D, FIC

PRINCIPAL

Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506

A handwritten signature in green ink, appearing to be "P. Perumal".

Principal

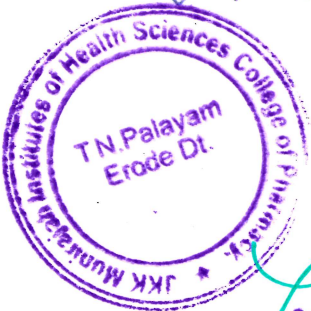
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506

DECLARATION

This is to certify that the Research entitled “**FORMULATION AND EVALUATION OF TOPICAL FORMULATIONS OF BOSWELLIC ACIDS AND GUGGULOSTERONES FOR RHEUMATOID ARTHRITIS TREATMENT**” submitted to The **JMS Pharmaceutical Private Limited**, is the bonafide project work carried out in the Department of Pharmacology, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode, Under the guidance of **DR. M. PERIASAMY, M. Pharm., Ph. D., Professor, Department of Pharmacology, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N Palayam, Gobi, Erode.** During the academic year 2021-2022.

Place: T.N-Palayam

Date: 20.12.2021



Principal

JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506


DR. M. PERIASAMY, M. Pharm., Ph. D.,

Principal Investigator


Dr. S. SATHEESH, Pharm. D.,

Co-Investigator


Ms. M. REVATHI, M. Pharm.,

Co-Investigator

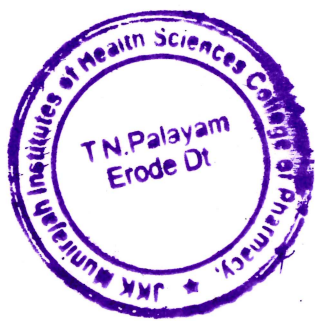

Mr. S. DEEPANCHAKKARAVARTHI, M. Pharm.,

Co-Investigator

DECLARATION

The research work embodied in this work entitled "Formulation and Evaluation of Topical Formulations of Boswellic Acids and Guggulosterones for Rheumatoid Arthritis Treatment" was carried out by us under the direct supervision of DR. M. PERIASAMY, M. Pharm., Ph. D., Professor, Department of Pharmacology, JKK Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi.

The Project submitted to the **JMS Pharmaceutical Private Limited**, during the academic year 2021-2022.



A handwritten signature in green ink, appearing to be "M. Periasamy".

Principal
JKK Munirajah Institute of Health Science:
College of Pharmacy, T.N.Palayam,
Gobi (Tk), Erode (Dt) - 638 506

ACKNOWLEDGEMENT

First and foremost we express our heartfelt sense of gratitude and faithfulness to God 'grace and our family members, which has enabled us to finish our project work successfully.

With the blessing of our Founder chairman Dr. J.K.K Munirajah, M.Tech, (Bolton). D.Litt., and Secretary Mrs. Kasthuripriya Kirupakarmurali, M.B.A.,

J.K.K Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode for providing all the facilities to carry out this work.


Our sincere gratitude to our beloved sir, Dr. P.Perumal, M.Pharm, Ph.D,FIC., Principal and Head of the Department of Pharmaceutical Chemistry, J.K.K Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode for his kindly support for our project work and for his encouragement and also providing all facilities in this Institute to the fullest possible extent enabling us to complete this work.

With the immense pleasure and pride, we would like to take opportunity in expressing our deep sense of gratitude to our beloved guide DR. M. PERIASAMY, M. Pharm., Ph. D., Professor, Department of Pharmacology J.K.K Munirajah Institute of Health Sciences College of Pharmacy, T.N-Palayam, Gobi, Erode under whose active guidance, innovative ideas, constant inspiration and encouragement of the work entitled "Formulation and Evaluation of Topical Formulations of Boswellic Acids and Guggulosterones for Rheumatoid Arthritis Treatment" has been carried out.

We also express our grateful thanks to all the teaching and non-teaching staff members of J.K.K Munirajah Institute of Health Sciences College of Pharmacy for their valuable advice and cooperation.

We express our heartfelt gratitude to the almighty, for giving us the right way to achieve the best of our project.



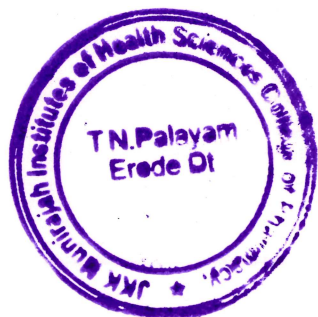

Principal
J.K.K. Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506

We would like to give sincere thanks to our classmates for their timely help and co-operation.

We also extend our thanks to all staff members of Department of Pharmaceutical Biotechnology, Pharmaceutical Chemistry, Pharmacognosy, Pharmaceutics and Pharmacology for their co-operation.

We would like to thank JMS Pharmaceutical Private Limited to give a Financial and moral support to completion of the project being a successful manner on the duration of 2021-2022.

Last but not least, great thanks from the heart to our beloved MOTHER and FATHER. They are our living god, as who guided us in the rightful way to achieve all our activities. They gave the incredible effort to become a successful for bright future in this world. Thanks a lot, to my parents.



A handwritten signature in green ink, appearing to be "JKK".

Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506

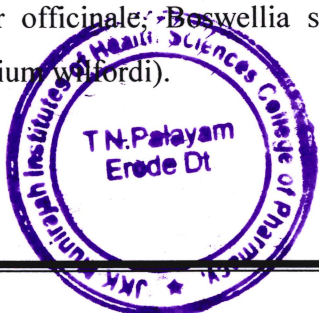
ABSTRACT:


Rheumatoid arthritis (RA) is a debilitating autoimmune disease characterized by chronic joint inflammation. Conventional RA treatments often involve systemic medications with potential adverse effects. In this study, we aimed to develop and assess topical formulations containing boswellic acids and guggulosterones, renowned for their anti-inflammatory properties, as a novel approach to RA management. The evaluation of crude drug and the re-successive solvent extraction of resin was carried out. Development of gel was done by using carbapol 934 and PEG 400. It was concluded that it is possible to formulate the herbal gel for anti-arthritic activity by using Commiphora mukul and Boswellia serrata. The results showed that the content of Gel components had significant effect on their physical, rheological and in vitro drug release characterization.

INTRODUCTION:

Rheumatoid arthritis (RA), a complex autoimmune inflammatory disorder, affects multiple joints of the body in a systematic manner. Initially, there is a chronic inflammation of synovial membrane which often leads to articular cartilage destruction, bone erosion, and permanent deformity. The destruction of cartilage and bones is due to proliferation of synovium membrane which results in formation of pannus, i.e., the hypertrophied synovium. Radiologic manifestations of such damage appear as loss of joint space and juxta-articular bone erosion.

RA may have other systemic manifestations such as bone marrow alteration, comorbidities (pericarditis, osteoporosis, and lung disease), and psychosocial (depression and cognitive dysfunction) effects. RA can start at any age; however, the mean age of onset is 40-60 years. Furthermore, people suffering from RA have diminished functioning and shortened life expectancy up to 5-10 years; however, it also depends upon severity of disease and genetic factors. Exact cause of the disease is not clear precisely but hormonal, genetic, and environmental factors are important contributors in the development of disease. RA is immune cell-mediated disease with progressive nature and is initiated and promoted by release of inflammatory. More than 450 plants belonging to 100 families are used traditionally in management of arthritis. Some of the important natural compounds reported to exhibit anti-arthritic potential includes anthroquinone (Aloe barbadensis), withanolides (Withania somnifera), terpenes (Zingiber officinale, Boswellia serrata), polyphenols (Camellia sinensis), stilbene (Vitis vinifera, Tripterygium wilfordii).

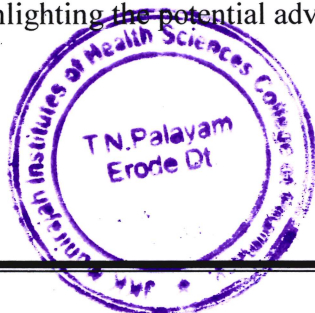




Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 505

Although a number of herbal medicines are recommended for RA, further research is required to investigate their safety, efficacy, and potential drug interactions. S357 cytokines by macrophages, B-cells, and T-cells. The various proinflammatory cytokines involved in articular cartilage destruction are tumor necrosis factor- α (TNF- α), interleukin-1 (IL-1), IL-6, IL-8, granulocyte-macrophage colony-stimulating factor, and transforming growth factor- β (TGF- β).[11] Degrading enzymes secreted by fibroblast-like synoviocytes and macrophages play a key role in cartilage and bone destruction.[Elevated levels of vasoactive amines, arachidonic acid metabolites, proinflammatory cytokines, and neuropeptides activate the RA synovium.

OBJECTIVES:

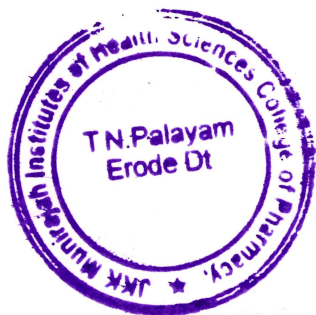
1. To develop a range of topical formulations (e.g., creams, gels, ointments) containing Boswellic Acids and Guggulosterones with varying concentrations and excipients to optimize their stability, drug release, and skin permeation characteristics.
2. To assess the physicochemical properties of the formulated topical products, including viscosity, pH, spreadability, and texture, to ensure their suitability for application and patient comfort.
3. To investigate the in vitro drug release profiles of Boswellic Acids and Guggulosterones from the topical formulations over time, using suitable release testing methods, such as Franz diffusion cells, to understand their release kinetic.
4. To evaluate the transdermal permeation potential of Boswellic Acids and Guggulosterones through synthetic skin barriers (e.g., Franz diffusion cells with synthetic membranes) to determine if the formulations can effectively deliver these compounds through the skin.
5. To conduct stability studies on the formulated topical products under various storage conditions (e.g., temperature, humidity, light) to determine their shelf-life and ensure that the formulations remain effective over time.
6. To compare the efficacy and transdermal delivery potential of the Boswellic Acids and Guggulosterones formulations with existing oral or systemic treatments for rheumatoid arthritis, highlighting the potential advantages of topical delivery.




Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506

RESULTS AND CONCLUSION:

The results obtained from present work indicated that the entire drug was uniformly distributed and there was no precipitation in formulation. For the incorporation of drugs, five formulae for gel were tried. In vitro drug release of Boswellic acid and Guggulsterones from gel was performed to study the release behavior of drug from formulation. From the observed results it was concluded that there is increase in the drug release with respect to time. From a patient compliance point of view, spreadability is a important for topical drug delivery system. The gel was found to exhibit good percentage spread by weight that would assure the skin application. Anti-Inflammatory, Anti-Arthritic study and Arthritis scoring of the prepared gel formulation evident the Anti-Arthritic activity of the prepared herbal gel formulation. Temperature stability study was performed to evaluate the separation as well as precipitation of the drug in the excipients mixture. It was observed that the formulation was stable at different temperatures (room temperature, cool temperature, elevated temperature and at 75% RH) for 60 days. In the present work, the attempt was made to formulate and evaluate a gel for anti-arthritic activity, using extracts of Boswellia serrata and Guggulsterones. The results showed that the content of Gel components had significant effect on their physical, rheological and in vitro drug release characteristics.



A handwritten signature in green ink, appearing to be "JKK".

Principal
JKK Munirajah Institute of Health Sciences
College of Pharmacy, T.N. Palayam,
Gobi (Tk), Erode (Dt) - 638 506