

Abstract

Development of Non-Antibiotic-Based Formulations and Materials for the Treatment of Recurrent Vaginal Infections [†]

Fatima Yahya Zabara *, Amal Abdul Hakeem Abdulla, Farah Suhail Alhasan, Noor Ali Mahdi, G. Roshan Deen and Uwe Torsten

Materials for Medicine Research Group, School of Medicine, Royal College of Surgeons in Ireland, Medical University of Bahrain, Busaiteen 228, Bahrain; 23200199@rcsi.com (A.A.H.A.); 23201524@rcsi.com (F.S.A.); 21200211@rcsi.com (N.A.M.); rdeen@rcsi.com (G.R.D.); utorsten@rcsi-mub.com (U.T.)

* Correspondence: 23200810@rcsi.com

[†] Presented at the 3rd International Online Conference on Polymer Science, 19–21 November 2025; Available online: <https://sciforum.net/event/IOCPS2025>.

Keywords: vaginal infections; antibiotic resistance; bioactive films; curcumin; myrtus communis; recurrent infections

1. Introduction

Vaginal infections remain a prevalent global health concern among women, often resulting in symptoms such as pain, itchiness, and dysuria (1). Despite available treatments, recurrence and persistence of infections are common. This study explores a novel therapeutic approach using bioactive films composed of curcumin and *Myrtus communis* to manage recurrent vaginal infections. Importantly, the goal is to identify a natural solution that avoids the use of antibiotics, addressing concerns related to antibiotic resistance and the side effects associated with conventional treatments.

2. Methodology

Films were formulated using 2% sodium alginate and 10% polyvinyl alcohol (PVA), embedded separately with either pure curcumin or *Myrtus communis* extract to assess their individual contributions to the film's performance. The swelling behavior of each film type was assessed using standardized 1 × 1 cm samples, providing a reliable measure of their capacity to absorb moisture, which is critical for their functionality in a vaginal environment.

3. Preliminary Results

Both types of circular film samples exhibited swelling behavior. Notably, the curcumin-based films demonstrated superior swelling capacity compared to the *Myrtus communis* films; this difference might enhance the retention of moisture, which is beneficial for maintaining prolonged contact with the mucosal surface.

4. Conclusions and Future Work

The curcumin-based films showed promising swelling characteristics, suggesting potential for improved mucosal adherence and drug delivery in the vaginal environment. Further research is underway to enhance the swelling properties of the *Myrtus communis* films and evaluate the antimicrobial efficacy of both formulations.

Author Contributions: Conceptualization, G.R.D. and U.T.; methodology, F.Y.Z., A.A.H.A., F.S.A., N.A.M.; validation, F.Y.Z., A.A.H.A., F.S.A., N.A.M.; formal analysis, F.Y.Z., A.A.H.A., F.S.A., N.A.M.;



Academic Editor: Alessandro Pegoretti

Published: 14 November 2025

Copyright: © 2025 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article

distributed under the terms and

conditions of the [Creative Commons](#)

[Attribution \(CC BY\)](#) license.

investigation, F.Y.Z., A.A.H.A., F.S.A., N.A.M.; resources, G.R.D.; data curation, F.Y.Z., A.A.H.A., F.S.A., N.A.M.; writing—original draft preparation, F.Y.Z., A.A.H.A., F.S.A., N.A.M.; writing—review and editing, F.Y.Z., A.A.H.A., F.S.A., N.A.M.; visualization, F.Y.Z., A.A.H.A., F.S.A., N.A.M.; supervision, G.R.D.; project administration, F.Y.Z. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: All data supporting the results reported in this study are available from the corresponding authors upon request.

Conflicts of Interest: The authors declare no conflict of interest.

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.