Dehydrozingerone-Based Antibiotic Gel Formulation for Diabetic Wound Healing

A Vidusha1 , Bruce Wayne1,a)

1Vidusha Medical Services, Lucknow, Uttar Pradesh, India

**Corresponding Author:** a)[ebatmobile@gmail.com](mailto:ebatmobile@gmail.com)

**Abstract:** A major healthcare concern, diabetic wounds are frequently characterized by poor wound healing, persistent inflammation, and heightened vulnerability to infections. A derivative of curcumin, dehydrozingerone has improved stability and bioavailability along with possible medicinal uses, anti-inflammatory, and antioxidant benefits.Development and potentialisation of a Dehydrozingerone-based formulation for diabetic wound healing.This includes making an anti-diabetic gel with carbopol, antibiotics (Doxycycline), curcumin derivatives (Dehydrozingerone), and filler materials (polysaccharide based macro fillers). Subsequently, the antimicrobial and anti-diabetic gels were examined using the disc diffusion method, the α-glucosidase and α-amylase inhibition assay, and biocompatibility tests for tissue reactivity on gingival fibroblasts.Antimicrobial tests demonstrated that the test sample effectively inhibited the development of the microorganisms, particularly S. aureus and E. faecalis. Additionally, it exhibits >85% biocompatibility and anti-diabetic potential, outperforming ascorbic acid in the inhibition of α-glucosidase and α-amylase. The new gel made with doxycycline and dehydrozingerone may be a better medication option for diabetic wound healing processes, including oral ulcers.

**Keywords**: Anti diabetic gel, Curcumin derivative, Dehydrozingerone, Doxycycline, diabetic wound healing, gingival fibroblasts.

# INTRODUCTION

Diabetes is a recognized risk factor for both delayed wound healing, which involves both soft and hard tissue components, and worsened periodontal disease, a dangerous gum infection that harms the soft tissue surrounding teeth. Diabetes has a complicated pathophysiology that includes vascular, neuropathic, immunological, and metabolic elements that contribute to impaired repair. Stiffer blood arteries are associated with hyperglycemia, which results in slower circulation and microvascular dysfunction, which lowers tissue oxygenation. These diabetic lesions are frequently not adequately addressed by conventional wound management techniques. As a result, there is increasing interest in creating novel therapeutic approaches to improve diabetic patients' wound healing. [(Kesharwani, 2025)](https://paperpile.com/c/29iGBV/Gc1w)[(Maheshwaran et al., 2024; Merchant et al., 2025; A. Shenoy, Rohinikumar, et al., 2023)](https://paperpile.com/c/29iGBV/eOoqJ+MhenC+eZTYp)[(Amrutha Shenoy, Vinay Sivaswamy, Subhabrata Maiti, Deepak Nallaswamy, n.d.; A. Shenoy et al., 2025; Vohra et al., 2024)(Amrutha Shenoy, Vinay Sivaswamy, Subhabrata Maiti, Deepak Nallaswamy, n.d.; A. Shenoy et al., 2025; Vohra et al., 2024)](https://paperpile.com/c/29iGBV/5O8T+Ljq8+YkrK)[(A. Shenoy, Ahmed, et al., 2022; A. Shenoy, Maiti, et al., 2023; A. Shenoy, Rajaraman, et al., 2022)](https://paperpile.com/c/29iGBV/QpLpS+4fxGa+1wnFt)The natural polyphenolic chemical curcumin, which is present in turmeric (Curcuma longa), has drawn interest due to its possible medical uses, such as its anti-inflammatory and antioxidant qualities. [(Hussain et al., 2017)](https://paperpile.com/c/29iGBV/uWun)[(Ajay et al., 2023; Chokkattu et al., 2023; Padarthi et al., 2023)](https://paperpile.com/c/29iGBV/Hpabj+ch89R+LkOW5)[(Dharman et al., 2023; S. Sindhu et al., 2023; Sreenivasagan et al., 2023)](https://paperpile.com/c/29iGBV/OdoxB+gwRLW+zCBxu)[(Ramakrishnan et al., 2023; N. D. Shenoy & Maiti, 2023; J. S. Sindhu et al., 2023)](https://paperpile.com/c/29iGBV/pAJm+Heep+NBUn)[(Kasabwala et al., 2021; Rajeshkumar & Lakshmi, 2021; Varghese et al., 2023)](https://paperpile.com/c/29iGBV/bjA47+gQaCD+x4lTm)[(Ramakrishnan et al., 2023; N. D. Shenoy & Maiti, 2023; J. S. Sindhu et al., 2023)](https://paperpile.com/c/29iGBV/pAJm+Heep+NBUn).However, curcumin's clinical utility has been limited due to its low bioavailability. In comparison to curcumin, dehydrozingerone, a derivative of curcumin, has improved stability and bioavailability. [(Mohanty & Sahoo, 2017)](https://paperpile.com/c/29iGBV/8dWW) Curcumin derivative dehydrozingerone, also called 4-(4-hydroxy-3-methoxyphenyl)butan-2-one, keeps many of its pharmacological characteristics. It is structurally related to curcumin and is naturally present in ginger (Zingiber officinale). Curcumin's β-diketone moiety is replaced with a keto group, which increases stability and improves solubility. This makes it a desirable option for therapeutic formulations. [(Alavi et al., 2022)](https://paperpile.com/c/29iGBV/jCcj)[(Keerthana & Ramesh, 2021; Murugesan, 2021; Tiwari & Jain, 2021)](https://paperpile.com/c/29iGBV/1oIF+OjDQ+2G3D)[(Keerthana & Ramesh, 2021; Murugesan, 2021; Subramanian et al., 2021; Tiwari & Jain, 2021)](https://paperpile.com/c/29iGBV/1oIF+OjDQ+2G3D+wrw87)[(Pranati et al., 2021; Sakthi 2021)](https://paperpile.com/c/29iGBV/OGohB+uvEBt).Doxycycline, a broad-spectrum antibiotic belonging to the tetracycline class, is used to treat periodontitis, or bacterial gum infections. An antibiotic called doxycycline is used to treat a variety of illnesses, such as rosacea, skin infections, tooth and chest infections, and sexually transmitted infections (STIs). The design, discovery, and development of potentially innovative medications heavily relies on natural products. The creation and potentialization of a formulation based on dehydrozingerone for diabetic wound healing is the goal of this study. We go over the safety profile, the difficulties and potential paths for clinical translation of dehydrozingerone, and the reasons behind its impact on wound healing.

## MATERIALS AND METHODS

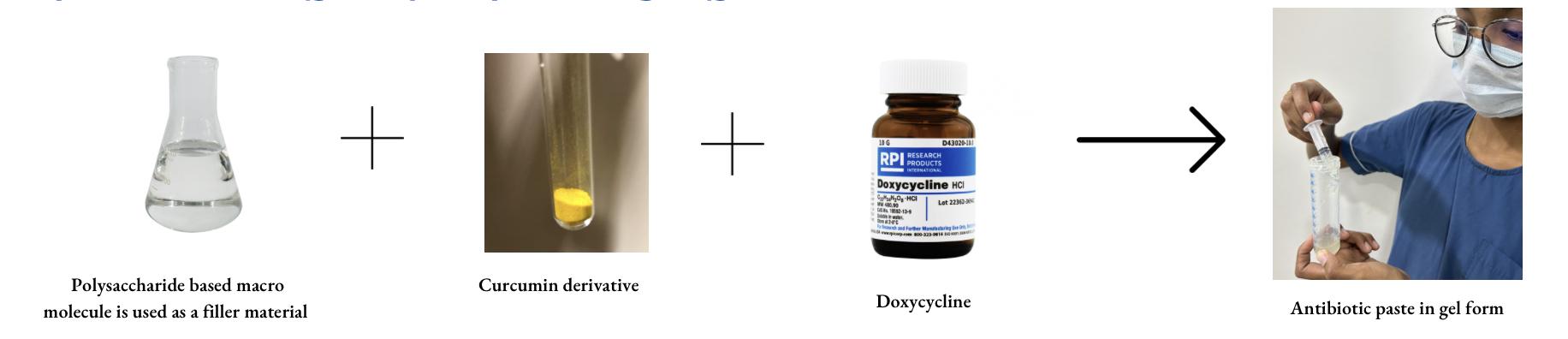


Fig 1: preparation

1. Preparation of 0.5% carbopol, or 0.5 g in 100 milliliters of distilled water
2. 10 milliliters of 0.5% carbopol
3. Ten milligrams of filler material
4. 4.5 mg derivative of curcumin
5. 4.5 mg of antibiotics

The filler substance used in this study is frequently found in lotions, ointments, serums, and moisturizing creams. It has also been shown to hasten wound healing and lessen scarring.In several sectors, carbopol, a water-soluble polymer, is utilized as an emulsifier, stabilizer, suspender, thickener, and gelling agent in hand sanitizer gels.

## Preparation of carbopol

To create a paste with a gel consistency, a specific amount of antibiotics, curcumin derivative, and filler materials are added, and everything is mixed evenly using a Vortex. When making gel, a homogeneous mixture of components is prepared using a vortex. [(Madamsetty et al., 2023)](https://paperpile.com/c/29iGBV/016C)The prepared anti diabetic gel is later subjected for the following assays,

## Anti microbial assay

This assay measures how susceptible a certain bacterium or fungus is to antibiotics(Almatrafi et al., 2024). Prior to determining their inhibitory spectra (wide vs. narrow), these are crucial instruments for testing and screening the inhibitory effects of several chemicals against microbes. [(Golub & Lee, 2020)](https://paperpile.com/c/29iGBV/1vkk)

## Anti diabetic assay

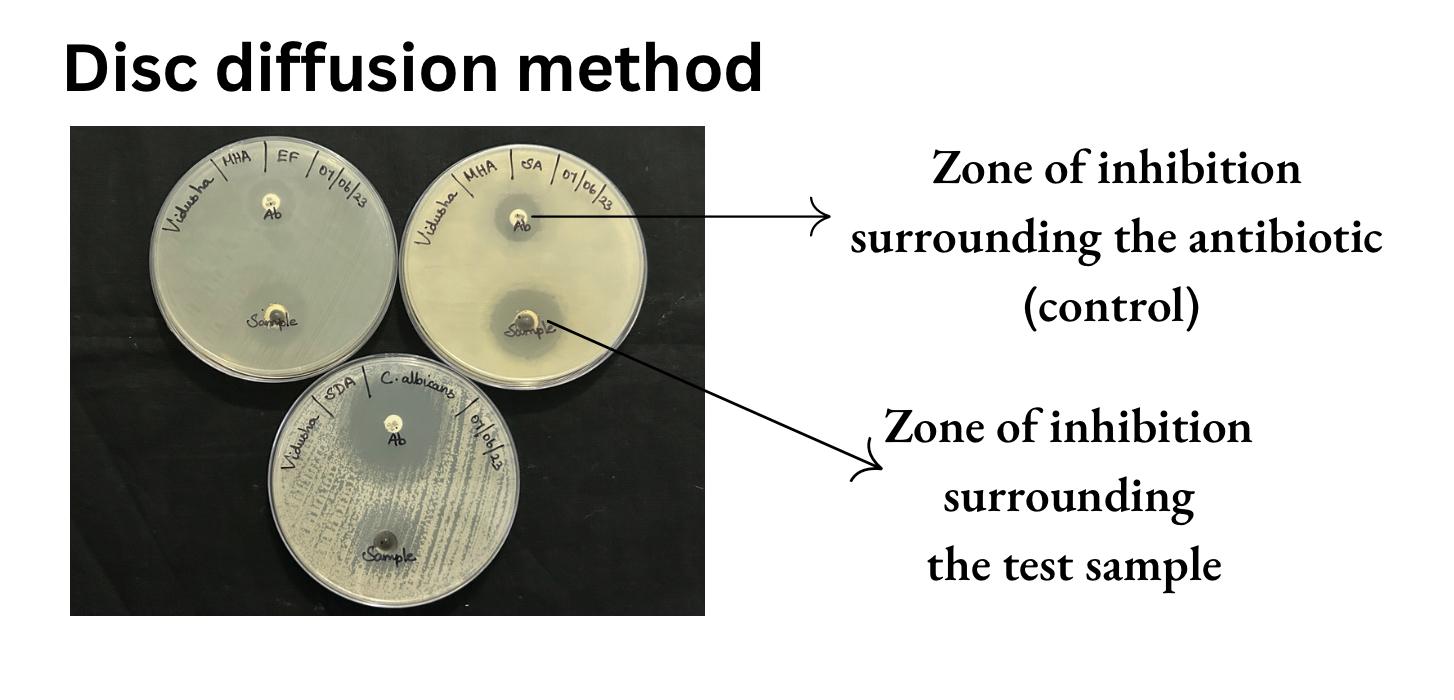
The purpose of anti-diabetic assays is to evaluate how well medications, natural substances, or treatment approaches may regulate blood sugar levels and treat the symptoms of diabetes(Saadh et al., 2024). Anti-diabetic tests come in a variety of forms, such as in vitro, in vivo, clinical, and biochemical tests. [(Shah et al., 2021)](https://paperpile.com/c/29iGBV/Mzim)

## Biocompatibility

In order to determine the possible biological risks associated with a particular material or a product, biocompatibility testing is usually done which entails a number of laboratory tests and assessments. Cytotoxicity testing, sensitization testing, systemic toxicity testing, hemocompatibility testing, implantation testing, and additional components and assays are frequently included in biocompatibility testing. [(Liu et al., 2022)](https://paperpile.com/c/29iGBV/9nhM)

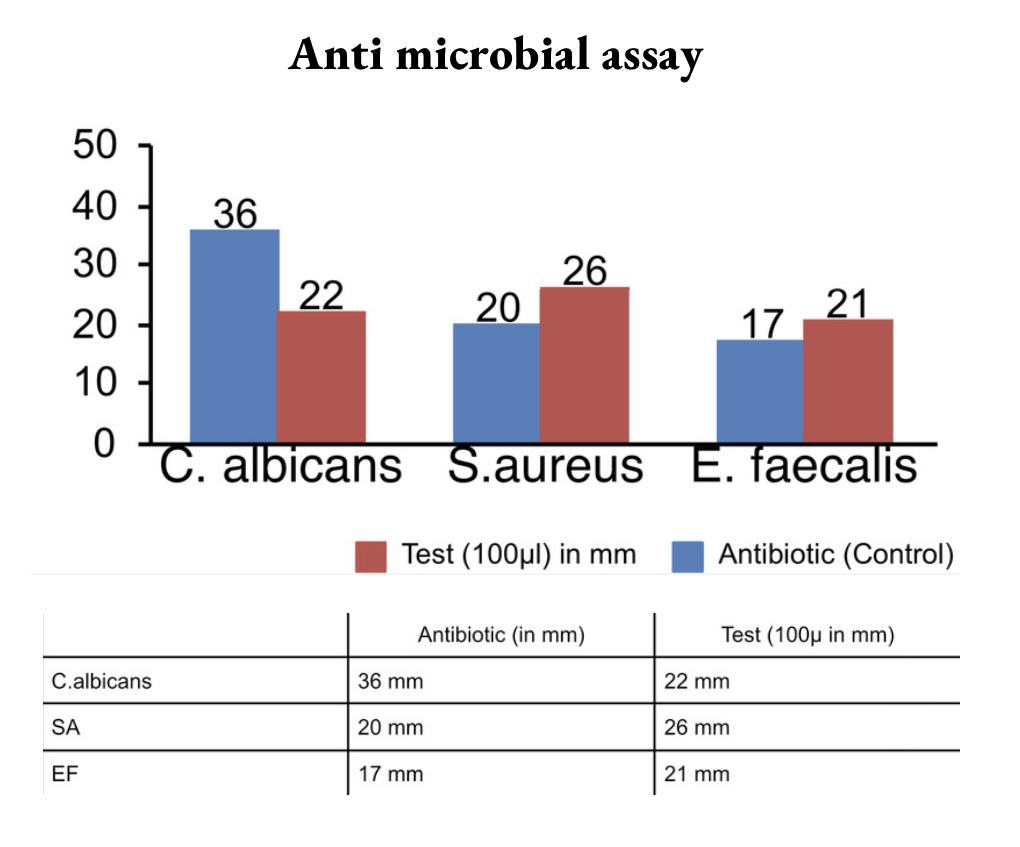
# RESULTS

## Anti microbial assay



**Fig. 2.** Disc diffusion method

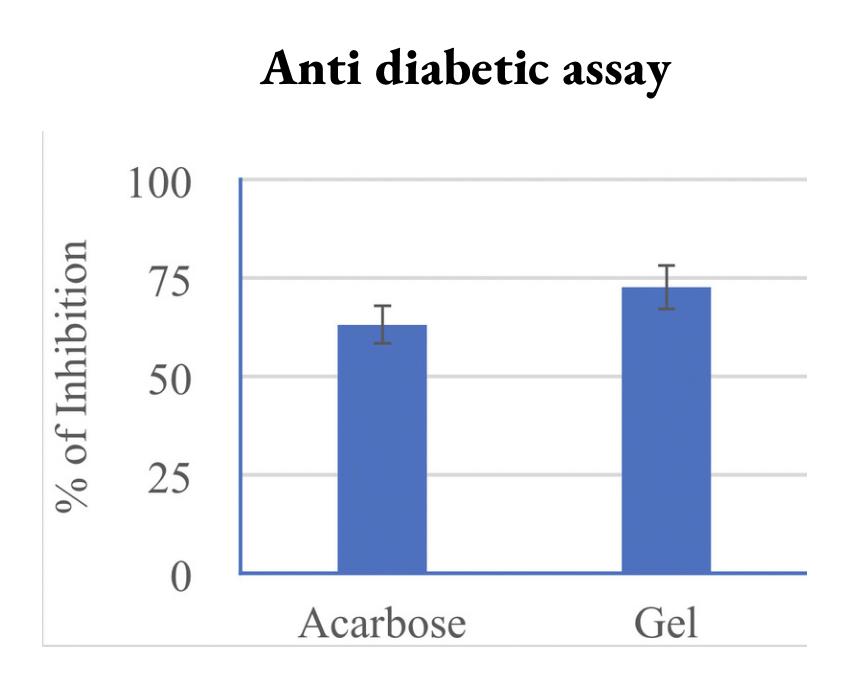
For both *S. aureus* and *E. faecalis*, the test sample's zone of inhibition is greater than the control's.



**Fig. 3.** Anti microbial assay

In the test sample, the growth of *S. aureus* and *E. faecalis* were controlled. However, when compared to the control, the anti-diabetic paste had no beneficial effects on *Candida albicans*.

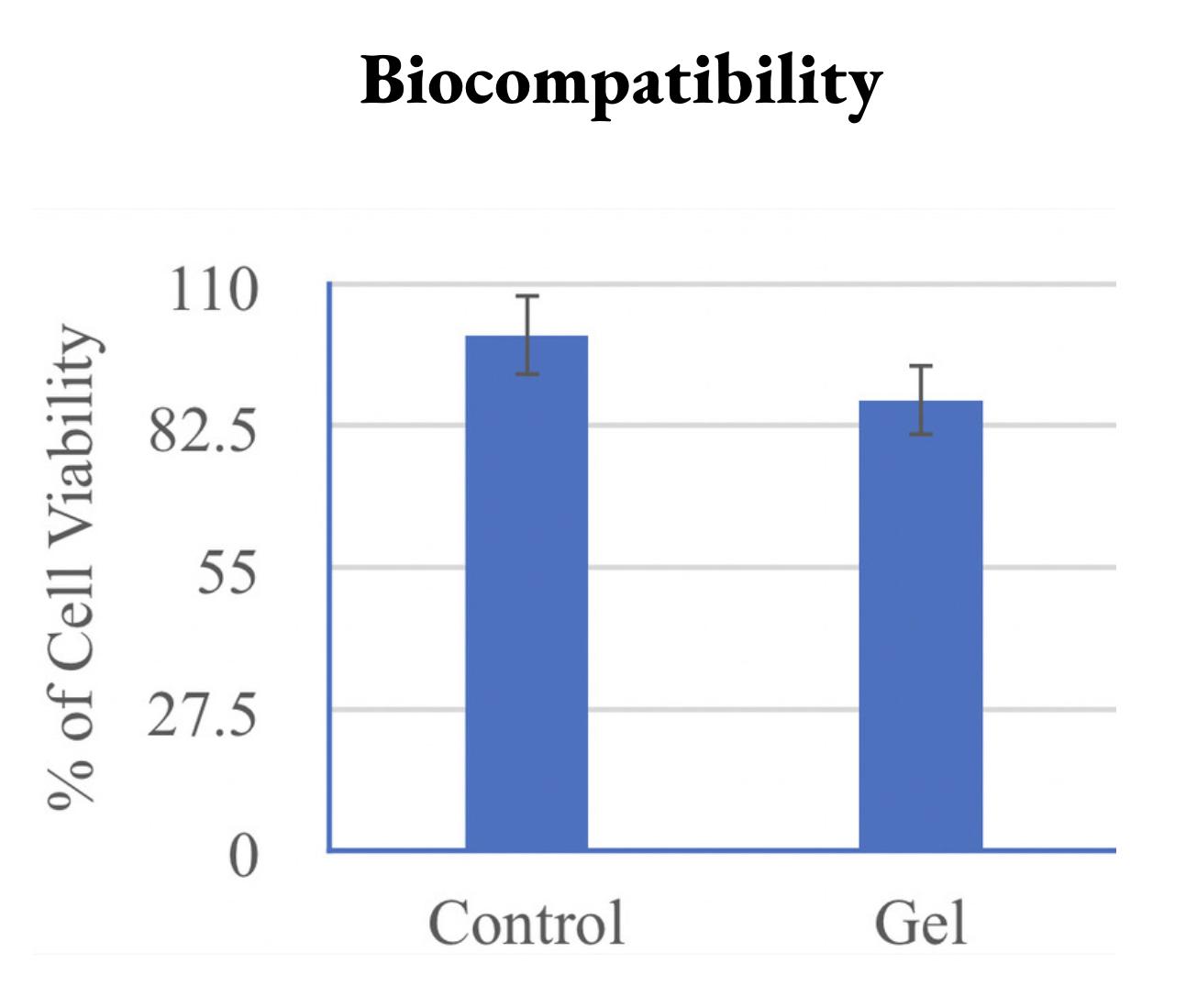
## Anti diabetic assay



**Fig.4**. Anti diabetic assay

Acarbose, the control, was contrasted with the test sample. Comparatively speaking, the test sample exhibits a larger percentage of α-glucosidase and α-amylase inhibition than the control (acarbose). [(Alven et al., 2022)](https://paperpile.com/c/29iGBV/Nlr8)

## Biocompatibility



**Fig.5.** Biocompatibility test

Tissue compatibility, also known as biocompatibility, refers to a material's capacity to elicit the proper host reaction when used as intended. When gingival fibroblasts are exposed to the test sample, the cell viability is greater than 80%. [(Chen et al., 2021)](https://paperpile.com/c/29iGBV/LdPO)

# DISCUSSION

Three microbes were used: Streptococcus aureus, a Gram-positive bacterium, Enterococcus faecalis, a Gram-positive bacterium found in patients with periodontitis and GIT, and Candida albicans, an opportunistic pathogenic yeast that is frequently found in the human mouth and gut to perform the antimicrobial assay using the Disc Diffusion method.The extract solution is applied to a filter paper disc and then placed on the agar surface in the disk diffusion method (DDM), which is categorized as an agar diffusion method (ADM). This technique aims to help a doctor choose treatment alternatives for his or her patients by identifying the pathogenic microbe's sensitivity or resistance to different antibiotic chemicals. [(Franco et al., 2025)](https://paperpile.com/c/29iGBV/Mvf1) For both *S. aureus* and *E. faecalis*, the test sample's zone of inhibition is greater than the control's. As a result, the test sample effectively inhibited the bacteria' growth.The sample and acarbose, the control, were contrasted. Comparatively speaking, the test sample exhibits a larger percentage of α-glucosidase and α-amylase inhibition than the control (acarbose). Acarbose slows down the breakdown of specific compounds in food (starch) to release glucose (sugar), which is how it treats type 2 diabetes. Acarbose lowers postprandial glucose blood concentrations by slowing the absorption of glucose through delayed carbohydrate breakdown. Acarbose functions by preventing an enzyme in the intestine from converting starchy carbs (such as bread, potatoes, etc.) to glucose. The body will absorb less glucose from food as a result, and the pancreas will have more time to produce more insulin, which will drop blood sugar levels after meals. [(Shah et al., 2021)](https://paperpile.com/c/29iGBV/Mzim)In the digestive system, a crucial enzyme called pancreatic α-amylase converts dietary carbohydrates like starch into simple monosaccharides. α-glucosidases further break them down into glucose, which is absorbed and goes into the bloodstream. By hydrolyzing 1, 4-glycosidic bonds of polysaccharides (starch, glycogen) to disaccharides, α-amylase initiates the digestion of carbohydrates. α-glucosidase then catalyzes the conversion of the disaccharides to monosaccharides, resulting in postprandial hyperglycemia.Amylose azure, an insoluble dye-coupled substrate used in the Alpha-Amylase Assay Kit, is broken down by α-amylase into soluble colorful products. The enzyme activity in the sample is proportional to the color intensity, which is measured at 595 nm. The blue-black complex that results from the reaction of iodine with starch and the breakdown of starch by amylase serve as the foundation for the test. The addition of an iodine solution, which results in a blue-black tint, indicates the amount of starch that is still present at the end of the incubation period. Alpha glucosidase can be quantitatively determined with this colorimetric technique.Tests of biocompatibility for cell viability are intended to determine whether a material or substance promotes cell growth and survival by evaluating its interactions with living cells. These tests are essential for determining if materials used in tissue engineering, implants, medical devices, and pharmaceutical formulations are compatible. Making sure the substance doesn't damage or impair cells when it comes into contact with them is the aim. In order to guarantee the efficacy and safety of materials used in biological and medical applications, these tests are crucial. They aid in the detection of possible hazards and in the creation of materials that encourage advantageous interactions with live cells and tissues. [(Alven et al., 2022)](https://paperpile.com/c/29iGBV/Nlr8)The substance or item under test is created in compliance with particular criteria and recommendations. In order to do this, test samples of different quantities or types (such as solid, liquid, or gel) must be created and sterilized. For the test, cells that are pertinent to the planned use are chosen. Gingival fibroblasts were employed as the cell culture in this investigation. In the lab, these cells are cultivated under carefully monitored circumstances. After that, the test substance (gel) is carefully added to the cultured cells in a controlled manner. This exposure might be indirect, like exposing the cells to material extracts, or direct, like putting the material in direct contact with the cells. To replicate the anticipated duration of contact between the material and cells in a real-world application, the test material and cells are incubated together for a predetermined amount of time, often 24 to 72 hours. We evaluated the cultivated cells' vitality following the incubation time. For this, a number of methods and tests are frequently employed, such as flow cytometry, MTT assay, and cell counting. We used cell counting to evaluate the biocompatibility, and the gingival fibroblasts' cell viability was greater than 80%.

# CONCLUSION

A curcumin derivative with improved stability and bioavailability, dehydrozingerone, exhibits great potential in the treatment of diabetic wounds. It is a desirable option for creating innovative wound care formulations due to its many different processes, which include anti-inflammatory, antioxidant, collagen-promoting, angiogenic, and antibacterial qualities.The outcome demonstrates that the test sample has effectively managed the growth of the microorganisms, particularly S. aureus and E. faecalis. Additionally, it exhibits >85% biocompatibility and anti-diabetic potential, outperforming ascorbic acid in the inhibition of α-glucosidase and α-amylase. As a result, it may be a better medication option for diabetic wound healing processes, including mouth ulcers. To fully realize its potential in enhancing the quality of life for diabetics with chronic wounds, however, successful clinical translation and the resolution of safety issues are required.

# REFERENCES

1. Almatrafi, T. A., Almohaimeed, H. M., Chakravarthi, S., Amin, A. H., Jafer, A., & Akhavan-Sigari, R. (2024). Reducing metastasis ability of gastric cancer cell line by targeting MMP16 using miR-193a-5p and 5-FU. Advances in Medical Sciences, 69(2), 463-473.
2. [Ajay, R., JafarAbdulla, M. U., Sivakumar, J. S., Baburajan, K., Rakshagan, V., & Eyeswarya, J. (2023). Dental alloy adhesive primers and bond strength at alloy-resin interface: A systematic review and meta-analyses. *The Journal of Contemporary Dental Practice*, *24*(8), 521–544.](http://paperpile.com/b/29iGBV/ch89R)
3. [Alavi, M., Moetasam Zorab, M., Ashengroph, M., Aljelehawy, Q. H. A., & Kahrizi, D. (2022). Antibacterial and wound healing applications of curcumin in micro and nano-scaffolds based on chitosan, cellulose, and collagen. *Cellular and Molecular Biology (Noisy-Le-Grand, France)*, *68*(3), 9–14.](http://paperpile.com/b/29iGBV/jCcj)
4. [Alven, S., Peter, S., Mbese, Z., & Aderibigbe, B. A. (2022). Polymer-Based Wound Dressing Materials Loaded with Bioactive Agents: Potential Materials for the Treatment of Diabetic Wounds. *Polymers*, *14*(4). https://doi.org/](http://paperpile.com/b/29iGBV/Nlr8)[10.3390/polym14040724](http://dx.doi.org/10.3390/polym14040724)
5. [Amrutha Shenoy, Vinay Sivaswamy, Subhabrata Maiti, Deepak Nallaswamy. (n.d.). *Evaluating Aesthetic Outcomes of Provisional Restoration Fabrication Techniques in Full Mouth Rehabilitation: An Updated Review*. https://doi.org/](http://paperpile.com/b/29iGBV/YkrK)[10.47750/jptcp.2023.30.10.037](http://dx.doi.org/10.47750/jptcp.2023.30.10.037)
6. [Chen, K., Pan, H., Ji, D., Li, Y., Duan, H., & Pan, W. (2021). Curcumin-loaded sandwich-like nanofibrous membrane prepared by electrospinning technology as wound dressing for accelerate wound healing. *Materials Science & Engineering. C, Materials for Biological Applications*, *127*, 112245.](http://paperpile.com/b/29iGBV/LdPO)
7. [Chokkattu, J. J., Mary, D. J., Shanmugam, R., & Neeharika, S. (2023). Evaluation clove ginger-mediated titanium oxide nanoparticles-based dental varnish against Streptococcus mutans Lactobacillus Species: vitro study. *World J Dent*, *14*(3), 233–237.](http://paperpile.com/b/29iGBV/LkOW5)
8. [Dharman, S., Maragathavalli, G., Shanmugam, R., & Shanmugasundaram, K. (2023). Curcumin mediated gold nanoparticles analysis its antioxidant, anti-inflammatory, antimicrobial activity against oral pathogens. *Pesquisa Brasileira Em Odontopediatria E Clínica Integrada*, *23*.](http://paperpile.com/b/29iGBV/gwRLW)
9. [Franco, R. R., Ferreira, A. E. A., Justino, A. B., Lima Júnior, J. P. D. E., Silva, H. C. G., Queiroz, J. S., Santiago, M. B., Martins, M. M., Oliveira, A. D. E., Morais, S. A. L., Cunha, L. C. S., Martins, C. H. G., Aquino, F. J. T. D. E., & Espindola, F. S. (2025). Phytochemical and in vitro antimicrobial and antidiabetical activities of Cordiera sessilis stem bark. *Anais Da Academia Brasileira de Ciencias*, *97*(2), e20241067.](http://paperpile.com/b/29iGBV/Mvf1)
10. [Golub, L. M., & Lee, H.-M. (2020). Periodontal therapeutics: Current host-modulation agents and future directions. *Periodontology 2000*, *82*(1), 186–204.](http://paperpile.com/b/29iGBV/1vkk)
11. [Hussain, Z., Thu, H. E., Amjad, M. W., Hussain, F., Ahmed, T. A., & Khan, S. (2017). Exploring recent developments to improve antioxidant, anti-inflammatory and antimicrobial efficacy of curcumin: A review of new trends and future perspectives. *Materials Science & Engineering. C, Materials for Biological Applications*, *77*, 1316–1326.](http://paperpile.com/b/29iGBV/uWun)
12. [Kasabwala, H., Nallaswamy, D., Subhashree, R., & Ahmed, N. (2021). Evaluation Of Overall Marginal Accuracy Of DMLS Copings Fabricated Using 3 Different DMLS Printing Machines. *Int J Dentistry Oral Sci*, *8*(7), 3335–3340.](http://paperpile.com/b/29iGBV/gQaCD)
13. [Keerthana, T., & Ramesh, S. (2021). Knowledge, attitude and practice survey on awareness of the association between diet and dental erosion. *International Journal of Dentistry and Oral Science*, *8*(2), 1533–1540.](http://paperpile.com/b/29iGBV/OjDQ)
14. [Kesharwani, P. (2025). *Recent Advances in Nanomedicines Mediated Wound Healing*. Elsevier.](http://paperpile.com/b/29iGBV/Gc1w)
15. [Liu, Y., Li, C., Feng, Z., Han, B., Yu, D.-G., & Wang, K. (2022). Advances in the Preparation of Nanofiber Dressings by Electrospinning for Promoting Diabetic Wound Healing. *Biomolecules*, *12*(12). https://doi.org/](http://paperpile.com/b/29iGBV/9nhM)[10.3390/biom12121727](http://dx.doi.org/10.3390/biom12121727)
16. [Madamsetty, V. S., Vazifehdoost, M., Alhashemi, S. H., Davoudi, H., Zarrabi, A., Dehshahri, A., Fekri, H. S., Mohammadinejad, R., & Thakur, V. K. (2023). Next-Generation Hydrogels as Biomaterials for Biomedical Applications: Exploring the Role of Curcumin. *ACS Omega*, *8*(10), 8960–8976.](http://paperpile.com/b/29iGBV/016C)
17. [Maheshwaran, B., Chokkatt, J. J., Shenoy, A., Ganapathy, D., Yadalam, P. K., Marrapodi, M. M., Cicciù, M., & Minervini, G. (2024). Therapeutic evaluation of titanium dioxide nanoparticles based herbal dental varnish derived from rosemary and ginger extracts:A comprehensive investigation into anti-inflammatory and antioxidant properties. *Technology and Health Care : Official Journal of the European Society for Engineering and Medicine*, *32*(4), 2783–2792.](http://paperpile.com/b/29iGBV/MhenC)
18. [Merchant, A., Pandurangan, K. K., Shenoy, A. D., Nallaswamy, D., & Singh, P. N. (2025). Comparison of marginal fit between milled and three-dimensional printed polymethylmethacrylate prostheses for single crowns, anterior bridges, and pier abutment bridges: An in vitro study. *Journal of Indian Prosthodontic Society*, *25*(1), 67–73.](http://paperpile.com/b/29iGBV/eOoqJ)
19. [Mohanty, C., & Sahoo, S. K. (2017). Curcumin and its topical formulations for wound healing applications. *Drug Discovery Today*, *22*(10), 1582–1592.](http://paperpile.com/b/29iGBV/8dWW)
20. [Murugesan, A. (2021). Saravana Dinesh SP evaluation of shear bond strength of ceramic brackets with two different base designs: An in-vitro study. *Int J Dentistry Oral Sci*.](http://paperpile.com/b/29iGBV/2G3D) <https://www.academia.edu/download/72981941/IJDOS_2377_8075_08_304.pdf>
21. [Padarthi, L. C., Anumula, L., Chinni, S. K., Sannapureddy, S., & Govula, K. (2023). Evaluation Composite Restoration Posterior Teeth Proanthocyanidin Pretreatment Liner Using Fédération Dentaire Internationale Criteria: Split-mouth Randomized Controlled Trial. *International Journal Prosthodontics Restorative Dentistry*, *13*(4), 191–200.](http://paperpile.com/b/29iGBV/Hpabj)
22. [Pranati, T., Ranjan, M., & Sandeep, A. H. (2021). Marginal adaptability custom made cast post made different techniques-a literature review. *Int J Dentistry Oral Sci*, *8*(8), 3954–3959.](http://paperpile.com/b/29iGBV/uvEBt)
23. [Rajeshkumar, S., & Lakshmi, T. (2021). Biomedical potential of zinc oxide nanoparticles synthesized using plant extracts. *Int J Dent Oral Sci*, *8*, 4160–4163.](http://paperpile.com/b/29iGBV/x4lTm)
24. [Ramakrishnan, M., Shanmugam, R., Neeharika, S., Chokkattu, J. J., Thangavelu, L., & Khanna, N. (2023). Anti-inflammatory activity and cytotoxic effect of ginger and Rosemary-mediated titanium oxide nanoparticles-based dental varnish. *World Journal of Dentistry*, *14*(9), 761–765.](http://paperpile.com/b/29iGBV/Heep)
25. [Sakthi, S(2021). Thymus vulgaris mediated selenium nanoparticles, characterization and its antimicrobial activity - an in vitro study. *International Journal of Dentistry and Oral Science*, 3516–3521.](http://paperpile.com/b/29iGBV/OGohB)
26. Saadh, M. J., Rasulova, I., Khalil, M., Farahim, F., Sârbu, I., Ciongradi, C. I. (2024). Natural killer cell-mediated immune surveillance in cancer: Role of tumor microenvironment. Pathology-Research and Practice, 254, 155120.
27. [Shah, S. A., Sohail, M., Minhas, M. U., Khan, S., Hussain, Z., Mahmood, A., Kousar, M., Thu, H. E., Abbasi, M., & Kashif, M. U. R. (2021). Curcumin-laden hyaluronic acid-co-Pullulan-based biomaterials as a potential platform to synergistically enhance the diabetic wound repair. *International Journal of Biological Macromolecules*, *185*, 350–368.](http://paperpile.com/b/29iGBV/Mzim)
28. [Shenoy, A., Ahmed, N., Rajaraman, V., Maiti, S., & Ganapathy, D. M. (2022). Comparative analysis of weld strength of nickel-chromium and cobalt-chromium base metal alloys when submitted to tungsten inert gas welding. *Journal of Advanced Pharmaceutical Technology & Research*, *13*(Suppl 2), S442–S446.](http://paperpile.com/b/29iGBV/4fxGa)
29. [Shenoy, A., Maiti, S., Nallaswamy, D., & Keskar, V. (2023). An comparison of the marginal fit of provisional crowns using the virtual tooth preparation workflow against the traditional technique. *Journal of Indian Prosthodontic Society*, *23*(4), 391–397.](http://paperpile.com/b/29iGBV/QpLpS)
30. [Shenoy, A., Maiti, S., Nallaswamy, D., & Srinivasan, M. (2025). A double-blind randomized crossover trial comparing the esthetic outcomes of CAD-CAM provisional restorations fabricated using CBCT and IOS acquisition methods. *Journal of Dentistry*, *153*, 105545.](http://paperpile.com/b/29iGBV/5O8T)
31. [Shenoy, A., Rajaraman, V., & Maiti, S. (2022). Comparative analysis of various temporary computer-aided design/computer-aided manufacturing polymethyl methacrylate crown materials based on color stability, flexural strength, and surface roughness: An study. *Journal of Advanced Pharmaceutical Technology & Research*, *13*(Suppl 1), S130–S135.](http://paperpile.com/b/29iGBV/1wnFt)
32. [Shenoy, A., Rohinikumar, S., Maiti, S., Sivaswamy, V., & Rajaraman, V. (2023). Evaluation of Peri-Implant Crestal Bone Loss with Different Implant Systems, Primary Stability, Bone Density and Soft Tissue Thickness: A Retrospective Study. *Journal of Long-Term Effects of Medical Implants*, *33*(4), 53–58.](http://paperpile.com/b/29iGBV/eZTYp)
33. [Shenoy, N. D., & Maiti, S. (2023). Evaluation marginal fit CAD/CAM crowns using CBCT digital scanners. *Annals Dental Specialty*, *11*(3-2023), 37–44.](http://paperpile.com/b/29iGBV/pAJm)
34. [Sindhu, J. S., Maiti, S., & Nallaswamy, D. (2023). Comparative analysis on efficiency and accuracy of parallel confocal microscopy and three-dimensional in motion video with triangulation technology-based intraoral scanner under influence of moisture and mouth opening - A crossover clinical trial. *Journal of Indian Prosthodontic Society*, *23*(3), 234–243.](http://paperpile.com/b/29iGBV/NBUn)
35. [Sindhu, S., Maiti, S., & Nallaswamy, D. (2023). Factors affecting accuracy intraoral scanners-a systematic review. *Annals Dental Specialty*, *11*(1-2023), 40–52.](http://paperpile.com/b/29iGBV/OdoxB)
36. [Sreenivasagan, S., Subramanian, A. K., Mohanraj, K. G., & Kumar, R. S. (2023). Assessment of toxicity of Green Synthesized Silver Nanoparticle-coated Titanium Mini-implants with Uncoated Mini-implants: Comparison in an Animal Model Study. *The Journal of Contemporary Dental Practice*, *24*(12), 944–950.](http://paperpile.com/b/29iGBV/zCBxu)
37. [Subramanian, E., Ravindran, V., & Jeevanandan, G. (2021). Comparison of amount of tooth reduction in primary first molar for stainless steel, zirconia and fibre-glass crowns–in-vitro study. *International Journal of Dentistry and Oral Science*, *8*(7), 3427–3430.](http://paperpile.com/b/29iGBV/wrw87)
38. [Tiwari, A., & Jain, R. K. (2021). The effect of motivational and reminder therapy on the compliance of patients wearing fixed appliances. *Int J Dent Oral Sci*, *8*(7), 3303–3305.](http://paperpile.com/b/29iGBV/1oIF)
39. [Varghese, R., Maliael, M., & Subramanian, A. (2023). Antibacterial activity of nanoparticle-coated orthodontic archwires: A systematic review. *Journal of International Oral Health: JIOH*, *15*(1), 1.](http://paperpile.com/b/29iGBV/bjA47)
40. [Vohra, M., Pandurangan, K. K., Shenoy, A., & Keskar, V. (2024). A Comprehensive Review of the Surface and Chromatic Properties of Monolithic Zirconia: Evaluating the Impact of Polishing and Finishing Methods on Aesthetics and Performance. *Cureus*, *16*(8), e66029.](http://paperpile.com/b/29iGBV/Ljq8)