JBP
Journal of Biochemicals and Phytomedicine
eISSN: 2958-8561

Formulation and Design of Antidiabetic Tablets from *Eucalyptus camaldulensis* Using Wet Granulation and a 2^3 Factorial Design

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ARTICLE INFO

Article Type:
Research

Article History:
Received: 30 Apr 2025
Revised: 8 Jul 2025
Accepted: 10 Jul 2025
Available online: 23 Sep 2025

Keywords:
Eucalyptus camaldulensis,
Antidiabetic agents,
Plant extracts,
Tablets,
Drug formulation,
Factorial design

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ABSTRACT

Introduction: *Eucalyptus camaldulensis*, recognized for its antidiabetic and antimicrobial properties, was formulated into an oral tablet to improve its clinical applicability. This study optimized critical formulation parameters via a 2^3 factorial design to produce tablets meeting pharmacopeial standards.

Methods: Eight formulations were prepared by wet granulation, evaluating three independent variables: binder (PVP) concentration, disintegrant (croscarmellose sodium) concentration, and kneading time. Tablets were assessed for weight variation, thickness, hardness, friability, disintegration time, and drug release in 0.1N HCl (paddle method, 75 rpm) analyzed at 258 nm.

Results: All formulations complied with standard requirements. Tablet hardness ranged from 4.42–5.42 kg, friability was <1%, and disintegration time varied between 0.55–2 minutes. Drug release at 45 minutes exceeded 91.4%, with some formulations reaching 98.8%. Factorial analysis identified optimal variable levels for quality attributes.

Conclusion: *E. camaldulensis* was successfully formulated into rapidly disintegrating tablets with high drug release, suitable for potential use in type 2 diabetes management. Further in vivo and clinical studies are warranted.

Please cite this paper as:
H Dawoud AD, Baraka Abdalla D. Formulation and design of antidiabetic tablets of *Eucalyptus camaldulensis* using wet granulation technique and 2^3 factorial design. Journal of Biochemicals and Phytomedicine. In press. doi: 10.34172/jbp.2025.x