

Extended Abstract

Formulation and Evaluation of an Antimicrobial Cream Containing Cinnamon Oil for Topical Application [†]

Fawzia Sha'at ^{1,2,*}, Ramona-Daniela Pavaloiu ^{1,2}, Cristina Hlevca ¹, Adela Staras ¹, Iuksel Rasit ¹, Erand Mati ³, Mihaela Voicu ³, Roxana Serban ³ and Lucia Pirvu ¹

¹ National Institute for Chemical-Pharmaceutical Research & Development—ICCF, Bucharest, 112, Vitan Av., Bucharest 31299, Romania; pavaloiu_daniella@yahoo.com (R.-D.P.); chlevca@gmail.com (C.H.); adela_staras@yahoo.com (A.S.); iuksel_rasit@yahoo.com (I.R.); lucia.pirvu@yahoo.com (L.P.)

² Faculty of Applied Chemistry and Materials Science, University Politehnica of Bucharest, 1-7 Gheorghe POLIZU St., Bucharest 011061, Romania

³ S.C. SLAVIA PHARM SRL, 44C Theodor Pallady Bvd., Bucharest 032266, Romania; erand.mati@slaviapharm.ro (E.M.); mihaela.voicu@slaviapharm.ro (M.V.); roxana.serban@slaviapharm.ro (R.S.)

* Correspondence: fawzya.shaat@gmail.com

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1. Introduction

Dermocosmetic products help alleviate certain conditions and have therapeutic advantages regarding skin protection/repairing/prevention. On this subject, the necessity for developing new topical antimicrobial products has increased significantly due to growing concerns regarding multidrug-resistant bacterial, viral, and fungal strains [1,2]. Due to its antioxidant and antibacterial properties, cinnamon oil improves blood flow to the surface of the skin, helps remove dead skin cells, re-establish the skin softness, and could provide relief from eczema [3,4]. The aim of this study was to formulate topical creams containing different concentrations of cinnamon oil and evaluate the *in vitro* antibacterial activity and the release behaviour of cinnamon oil from the optimal topical product-based cream.

2. Materials and Methods

Herein, we prepare topical creams by melting the waxes at 75 °C; the aqueous phase slowly has been added to the oil phase with moderate agitation and was kept stirred until the temperature dropped to 40 °C. The emulsion was cooled to room temperature to form a semisolid cream base. Formulation of optimal cream was followed by evaluating its organoleptic characteristics, physicochemical properties, and *in vitro* antibacterial activity against several bacterial strains. The cinnamon oil diffusion from optimal formulation was assessed through Franz cell experiments. The samples were taken at predetermined intervals for 2 days from the receiver solution (50% Ethanol). The released active ingredient in each time point was determined by spectrophotometry using a UV-VIS spectrophotometer. The results were computed by the use of six mathematical models: Zero order, First order, Higuchi, Weibull, Korsmeyer-Peppas and Hixson-Crowell.

3. Results

Cinnamon oil had a strong antibacterial activity. Release kinetics models: Zero Order, First Order, Weibull, Korsmeyer-Peppas, Higuchi, and Hixson–Crowell were applied to predict essential oil release profile. The Korsmeyer-Peppas model best described cinnamon oil release from cream.

4. Conclusions

This study indicates clear evidence supporting the traditional use of cinnamon oil in treating skin and wound infections related to bacteria.

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