

**UNIVERSITI TEKNOLOGI MARA**

**INHIBITION OF *Candida albicans* BIOFILM USING  
TOPICAL ANTIFUNGAL CREAMS**

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Dissertation submitted in partial fulfillment  
of the requirements for the degree of  
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**(Applied Biology)**

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## AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## ABSTRACT

*Candida albicans* is a microbial fungus that exists as a commensal member of the human microbiome and an opportunistic pathogen. Biofilm formation by this fungal pathogen occurs mostly in the mucosa or endothelium associated with candidiasis and also colonizes medical devices, such as vascular and urinary catheters and dentures. Improper use of antifungal agents has caused drug resistance. It happened when there are too many antifungal drugs used to treat diseases caused by *C. albicans*. The aim of this research was to determine the effects of the antifungal creams on biomass, viability and biochemical composition of *C. albicans* biofilm. Four commercial antifungal creams were selected herein namely econazole nitrate (Cream A), miconazole nitrate (Cream B), ketoconazole (Cream C) and tolnaftate (Cream D) -based antifungal creams. Crystal violet assay, resazurin assay and infrared spectral analysis were performed to determine the biomass, viability and biochemical composition of *C. albicans* biofilm respectively. Among these four antifungal creams, miconazole nitrate-based antifungal cream (Cream B) showed the strongest inhibition of biofilm biomass (65.12%) and viability (17.08%). Miconazole nitrate-based antifungal cream showed that nucleic acid was affected through the shifting of Fourier transform infrared (FTIR) spectra at a wavenumber of  $1240\text{ cm}^{-1}$ . The findings from the present study may be useful to control disease caused by *C. albicans* such as candidiasis which had been categorised as a main problem affected on human being.

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