COMPARATIVE ANTIMICROBIAL EFFICACY OF MULTI-PURPOSE CONTACT LENS SOLUTIONS AGAINST *ACANTHAMOEBA* CYSTS FROM ENVIRONMENTAL ISOLATES

By

AINI SURAYA BINTI NIZAM

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DECLARATION

I hereby declare that this thesis is my original work and have not been submitted previously or currently for any other degree in UiTM or other institutions.

Signature

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Name: AINI SURAYA BINTI NIZAM

Matrix Number: 2013857522

Date: July 2017

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ABSTRACT

Acanthamoeba sp. are free-living amoebae that are widely distributed in the environment. They have been isolated from various sources such as soil, dust, air, swimming pools, air-conditioning units and tap water. These amoebae can easily enter the body from the environment and cause an infection. Two environmental isolates [SG7 and M (1) 2] were tested against three contact lens solutions that does not contain hydrogen peroxide which are Renu Fresh®, Complete RevitaLens™, Opti-free Puremoist®, and two hydrogen peroxide-containing contact lens solutions which are Oxysept® and AOsept® Plus. The two environmental isolates were soaked in these contact lens solutions for 4, 6, 8 and 24 hours. After soaking time, the mixtures of *Acanthamoeba* sp. and contact lens solution are then inoculated onto non-nutrient agars seeded with heat-killed *Escherichia coli*. The agar plates were observed daily under a microscope until day 11. The observations were stopped when there is presence of *Acanthamoeba* sp. The isolates were also stained with methylene blue to determine its group whether Group I, II or III. The findings showed positive results for all of the contact lens solutions tested for both isolates at 4, 6, 8 and 24 hours of soaking time. These findings indicate that all of the tested solutions did not give any effect to the *Acanthamoeba* isolates. There were no significance differences between the tested contact lens solutions ($p>0.05$). All of the five contact lens solutions tested showed inefficacy in eradicating two of the environmental isolates of *Acanthamoeba* sp. [SG7 and M (1) 2]. Based on the morphology of the cysts of the two isolates, both isolates were less than 18 µm in diameter with polygonal endocyst and thick ectocyst. These characteristics are consistent with characteristics of Group II. These data suggest that the contact lens solutions used were not capable of completely killing *Acanthamoeba* sp. from environmental isolates even after soaking for minimum hours recommended by the manufacturer and that environmental *Acanthamoeba* sp. were mostly from Group II.