

**CURRENT RESEARCH  
AND DEVELOPMENT IN  
BIOTECHNOLOGY  
ENGINEERING  
AT IIUM**

**VOLUME I**

Editors:

Suleyman Aremu Muyibi  
Mohammed Saedi Jami  
Zaki Zainudin



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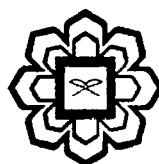
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## CHAPTER 11

### INVESTIGATION OF ANTIBACTERIAL ACTIVITY OF *MORINGA OLEIFERA* SEEDS FOR APPLICATION IN WATER TREATMENT

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#### ABSTRACT

This study focused on developing an efficient and cost effective processing technique for *Moringa Oleifera* seeds to act as disinfectant for use in drinking water treatment. The main objective was to investigate the antibacterial properties of *Moringa Oleifera* to act as disinfectant for disinfection process. Various methods of processing *Moringa Oleifera* seeds were used to evaluate the performance of the seeds as a disinfectant. The methodology included grinding, oil extraction, water extraction, salt extraction and microfiltration process. Three parameters affecting disinfection made up of varying the *Moringa Oleifera* seeds concentration, mixing speed and contact time by using the Central Composite Design (CCD). Then, *E. coli* was used as test microorganism for the antibacterial test. Result showed that salt extraction method gave the highest percentage of *E. coli* killed which is 95.7%. While the minimum residual obtained was 1CFU/mL by using 3mg/L of seeds concentration at 50rpm in 20minutes of contact time.

**Keywords:** processed *moringa oleifera* seeds, disinfection, antibacterial properties

#### INTRODUCTION

Conventional water treatment includes a series of processes (coagulation, flocculation, clarification through sedimentation, filtration and disinfection) that when applied to raw water sources contribute to the reduction of microorganisms of public health concern (Geldreich, 1996). Disinfection refers to the reduction in the number of pathogenic microorganisms to a level that is considered to be safe for the particular environment (Campbell et al., 1999). Water disinfection is accomplished with chemical or physical disinfectants and the most common of these is chlorine which is added to water as a gas or solid and the specific disinfection referred to as chlorination (Betancourt & Rose, 2004). However, chlorine has been identified to produce potentially hazardous by products such as trihalomethanes.

On the other hand, naturally occurring alternatives are generally considered safe compared to conventionally use chemical agents. These alternatives include *Moringa Oleifera* press cake which is efficient in the removal of hydrophobic organic pollutants from water. In addition to the strong water clarifying properties, *Moringa Oleifera* seeds have also been reported removing more than 90% of cercariae from the water phase. Bacterial numbers are