

# CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME IV

Editors:

Ma'an Alkhatib  
Abdullah Al Mamun  
Faridah Yusof



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*(VOLUME IV)*

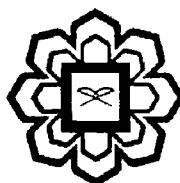
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## CHAPTER 22

### COAGULATION PERFORMANCE OF BIOACTIVE CONSTITUENTS ISOLATED FROM *MORINGA OLEIFERA* SEED IN LOW TURBIDITY WATER TREATMENT

Suleyman A. Muyibi, Eman N. Ali , Mohamad Ramlan Mohamed Salleh, Hamzah Mohd Salleh and Md Zahangir Alam

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#### ABSTRACT

The bioactive constituents of the *Moringa Oleifera* seeds were concentrated by extracting the oil which comprises 35% of the seeds weight. Then by using the ion exchange technique, the bioactive constituents of the seeds were isolated at the NaCl gradient concentration of 1 M. the results gave three peaks of bioactive constituents. The performance of the isolated constituents in removing the turbidity of low turbid water (less than 50 NTU) was evaluated using the synthetic waste water. All the three peaks showed good coagulation activity as monitored by the conventional jar tests. By using only a very low dosage of bioactive constituent's concentration (2 mg/L), more than 60% turbidity of the samples was able to be removed without using any other additives.

**Keywords:** *moringa oleifera*, drinking water treatment, bioactive constituents, coagulation, flocculation, turbidity.

#### INTRODUCTION

Waterborne diseases still kill on the average of 25,000 people every day in the developing countries while millions suffer the debilitating effects of these diseases (Kalbamatten & Burns, 1983). More than 6 million children die of diarrhea in the developing countries every year due to the use of highly turbid river water in their daily life. To overcome this problem, all sources of water must have some form of purification before its consumption (McConnachie *et al.*, 1999). Coagulation-flocculation followed by sedimentation, filtration and disinfection, often by chlorine, is used worldwide in the water treatment industry before it can be used by the consumers (Ndabigengesere & Narasiah, 1998). Many coagulants such as inorganic coagulant, synthetic organic polymer and natural coagulant (Muyibi, *et al.*, 2001) were used in the conventional water treatment processes for potable water production. However, there is a fear that aluminum which is the major component of PAC and alum may induce Alzheimer's disease (Crapper *et al.*, 1973; Miller *et al.* 1984; Martyn *et al.*, 1989). Among them, undoubtedly, the natural coagulants are usually presumed safe for human health.

During the past 10 years there has been a resurgence of interest in natural coagulants for water treatment in the developing countries that many studies have been carried out and