

# CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME II

Editors:

Ibrahim Ali Noorbatcha  
Hamzah Mohd. Salleh  
Mohamed Elwathig Saeed Mirghani  
Raha Ahmad Raus



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## CHAPTER 50

### IMPROVEMENT OF EXTRACTION PROCESSING CONDITIONS FOR ANTIFUNGAL COMPOUNDS FROM *Alpinia galanga*

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#### ABSTRACT

*Alpinia galanga* is a rhizomatous herbaceous perennial plant of the ginger family, Zingiberaceae that is known for its antifungal property. In this study optimization of extraction processing conditions were determined to obtain maximum yield of antifungal compounds from *A. galanga*. Optimization experiments designed by Box-Behnken (Design Expert Software) were carried out with three parameters considered namely agitation, extraction time and temperature. Analysis of results was done statistically using Analysis of Variance (ANOVA). The regression equation analysis showed that the optimum condition in producing antibacterial compound was temperature 27°C, time 11.3 hours and agitation level 323 rpm which gave the maximum diameter of zone inhibition (39.1 mm).

**Keywords:** extraction, antifungal activity. *Alpinia galanga*, Box-Behnken

#### INTRODUCTION

For many years, crude extracts which contain some important bioactive compounds have been extracted from plants using solid-liquid extraction. According to Harrison *et al.* (2003), extraction is a process in which two phases come into contact with the objective of transferring a solute or particle from one phase to the other. In solid-liquid extraction process, one phase is liquid and the other phase is solid such as the extraction of caffeine from coffee beans. The extraction involves the transfer of soluble bioproducts. In this study, solid liquid extraction was used to extract antibacterial compounds from *Alpinia galanga* and conditions to extract are optimized to obtain high yield of antibacterial compounds. *A. galanga* was chosen as it has been long proven to possess antifungal activity (Jaju *et al.*, 2009) and has been proven safe to consume as it was used in daily cooking. The plant is a good candidate for the source of antifungal drug with minimal side effects.

*A. galanga* is a rhizomatous herbaceous perennial plant of the ginger family, Zingiberaceae which is native to tropical South Asia. In Malaysia, it is well-known as 'lengkuas'. This plant is reported to have essential oils such as cineole, methyl cinnamate, and