

**UNIVERSITI TEKNOLOGI MARA**

**DEVELOPMENT OF CHITOSAN FILM USING  
FUNGAL CHITOSAN FROM *Absidia butleri* dr.**

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## ABSTRACT

Chitosan is the product produced from the deacetylation of chitin when it is dissolved in diluted acetic acid. Chitosan can be made into chitosan film and has high potential to be applied in agriculture, food and especially pharmaceutical industry. In this study, fungal chitosan derived from *Absidia butleri* dr. which is a low molecular weight chitosan was used to make chitosan films. 2.5%w/v of chitosan was dissolved with 0.5 %, 1% and 2%v/v acetic acid. The solution was then stand for drying in the oven for 7 days with the temperature of 40 °C. The produced films were then analyzed by using FTIR equipment and the samples were analysed with wavelength region ranged from 4000 cm<sup>-1</sup> to 400 cm<sup>-1</sup>. The spectrum showed that the absorbance produced by the samples was similar to the spectrum obtained from unprocessed fungal chitosan and with commercial chitosan except that more absorbance was observed between the wavelengths of 1600 cm<sup>-1</sup> to 1000 cm<sup>-1</sup> in pure fungal chitosan. This is due to the effect from mixing with the stated amount of acetic acid. Therefore, fungal chitosan derived from *Absidia butleri* dr. is suitable to develop chitosan film due to it possessing many unique properties such as antibacterial and antifungal effects. Besides, with its low molecular weight properties, it can develop smooth surface chitosan film which contributes to its high penetrable into the skin when applying as transdermal drug delivery system.

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Chitin is the second most obvious biopolymer existed in nature. It is found in the crustacean shells, insect cuticles and fungal cell walls (Mau et al., 2006). Chitin is the structural element in the exoskeleton of crustaceans such as crabs, shrimp, prawns, krill and others (Polk et al., 2003). Its structures composed of straight-chain polymer and also classified as  $\gamma$ -chitin. It is insoluble in aqueous solutions and some common organic solvent.

Chitosan is produced when chitin is fully or partially deacetylated of naturally occurring biopolymer chitin, which is present in the exoskeleton of crustacea such as crab, shrimp, lobster, crawfish and insects. There is report that show chitosan to be a very potential polymer in various industry and can be used as adhesive agent, paper-sizing agent, chelating agent for metal ions and fruit-juice clarifying aids (Rungsardthong et al., 2006). Chitosan is relatively safe as it is non-toxic, biodegradable and has excellent film forming properties which can be very useful in various fields (Tharanathan et al., 2006).