

**UNIVERSITI TEKNOLOGI MARA**

**THE EFFECTS OF SUB-ACUTE EXPOSURE OF  
HAB10R12 ETHANOLIC EXTRACT ON THE  
EXPRESSION OF  
N-METHYL-D-ASPARTATE RECEPTOR-1  
SUBUNIT GENE IN MICE BRAIN**

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## TABLE OF CONTENTS

<b>CONTENTS</b>	Page
<b>TITLE PAGE</b>	
<b>APPROVAL FORM</b>	
<b>ACKNOWLEDGEMENTS</b>	ii
<b>TABLE OF CONTENTS</b>	iii
<b>LIST OF TABLES</b>	vii
<b>LIST OF FIGURES</b>	viii
<b>LIST OF PLATES</b>	ix
<b>LIST OF EQUATIONS</b>	x
<b>LIST OF ABBREVIATIONS</b>	xi
<b>ABSTRACT</b>	xiii
<b>CHAPTER ONE: INTRODUCTION</b>	1
<b>CHAPTER TWO: LITERATURE REVIEW</b>	
2.1 Endophytes	4
2.2 HAB10R12 Strain	7
2.3 Hippocampus	8
2.3.1 Long-term potentiation (LTP)	9
2.3.2 Long-term depression (LTD)	10

## **ABSTRACT**

NMDA-R1 subunit is important in synaptic plasticity and learning process. The aim of the present study was to determine the effect of HAB10R12 extract on the expression of N-Methyl-D-Aspartate Receptor-1 subunit gene in mice brain after sub-acute exposure of HAB10R12. Thirty mice were randomly divided into five groups which consist of normal saline, memantine, 5 mg/ml/kg, 10 mg/ml/kg and 20 mg/ml/kg of HAB10R12 treatments. All the groups of mice were treated by intraperitoneal (IP) administration for 14 days. The mice were sacrificed at day 15 and the brains were removed. RNA was extracted from the brains by using SV Total RNA Isolation System (Promega). QuantiFast SYBR Green RT-PCR Kit (Qiagen) was used to quantify the expression of NMDA-R1 subunit gene by using comparative threshold method that was recorded by Rotor-Gene 600 Series Software 1.7. The result showed that administration of 5mg/ml/kg HAB10R12 dose caused up-regulation of NMDA-R1 subunit gene in mice. In contrast, administration of 10 mg/ml/kg HAB10R12 dose to mice cause down-regulation of NMDA-R1 subunit gene. In conclusion, HAB10R12 might affect the expression of NMDA-R1 subunit gene in mice brain after sub-acute exposure.

Keywords: NMDA-R1subunit, HAB10R12, IP, Expression, Synaptic plasticity

# CHAPTER 1

## INTRODUCTION

The term endophyte was applied to any organism found within the plant (Wilson, 1995). Endophyte refers to all organisms inhabiting plant organs that at some time in their life that can colonize internal tissues of the plant without causing apparent harm to the host (Fernando *et al.*, 2008).

There may be as many as 1 million different species of endophytic fungi in the world, yet only about 100,000 have been described (Fernando, 2008). Endophytic fungi have been detected in hundreds of plants, including many important agricultural commodities such as wheat (Larran *et al.*, 2002), bananas (Pocasangre *et al.*, 2000), soybeans (Larran *et al.*, 2002), and tomatoes (Larran *et al.*, 2001) and spices such as cinnamomum (Mohd Syafiq, 2007).

Endophytes are most commonly fungi and bacteria that live within plants without causing apparent diseases to the plants. The symptomless natures of endophytes inhabiting plant tissues have prompted focus on endosymbiotic relationships between endophytes and their hosts (Saikkonen, 2007). Both of them get benefits from each