UNIVERSITI TEKNOLOGI MARA

# ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF *CURCUMA LONGA* IN AN EXPERIMENTAL STUDY IN RATS WITH CARRAGEENAN-INDUCED PAW EDEMA

IYLIA NUR DIYANA IBRAHIM

Dissertation submitted in partial fulfilment of the requirements for the degree of Bachelor of Pharmacy (Hons.)

Faculty of Pharmacy

November 2009

# ACKNOWLEDGEMENT

First of all, I want to thank to God because Alhamdulillah I am able to complete this task on time. Secondly, I want to thank to Prof. Dr. Aishah Adam, my PHR 555 Research course supervisor and also other Research course lecturers because gave me a lot of guidance that I cannot replace it with anything in this world. Thank a lot. Thirdly, I want to thank to the post-graduate students because gave me a lot of guidance and helping me a lot in conducting this experiment. Last but not least, I want to thank to my parents and my family because always give me moral supports when I need it and also in sense of money too. Thank you very much.

# TABLE OF CONTENTS

# ABSTRACT

Turmeric, *Curcuma longa* L. (Zingiberaceae), has been attributed to a number of medicinal properties in the traditional system of medicine for treating several common ailments. I want to investigate the anti-inflammatory effect of Turmeric in rats with carrageenan-induced paw edema and alterations in the glutathione (GSH) level and the activities of antioxidative enzymes (superoxide dismutase, catalase, and glutathione reductase), as marker of acute inflammation, following oral administration of Turmeric and Acetyl Salicylic Acid (ASA) in rats with carrageenan-induced paw edema. In the previous studies, the researchers found that 1) Turmeric reduced the development of carrageenan-induced paw edema, to a greater degree than ASA; 2) Turmeric and ASA alleviated increases in the activities of catalase enzyme resulting from edema caused by carrageenan injection. These results suggest that the anti-inflammatory effect of Turmeric on carrageenan-induced acute inflammation can be attributed to its ameliorating effect on the oxidative damage.

# CHAPTER 1

# INTRODUCTION

## 1.1 Background of the study

An antioxidant may be defined as any substance that when present at low concentrations, compared with those of the oxidizable substrate significantly delays or inhibits oxidation of that substrate. Antioxidants are produced *in vivo* to protect the body from harm that arises as a result of living an aerobic life. Antioxidants are also found abundantly in nature, particular in plants. This study aims to determine the anti-inflammatory activity of a well-known herb, turmeric or *Curcuma longa* L. belonging to the family Zingiberaceae. The name derives from the Latin term *terra merita*, meaning 'meritorious earth', referring to the colour of ground turmeric, which resembles a mineral pigment. Turmeric is named basically as 'yellow root' in many languages. It is an upright perennial herb with thick and fleshy rhizomes and leaves in sheaths, characteristic of the family Zingiberaceae. The plant reaches a height of about 1 m. The surrounding leaf sheaths taper near the leaf and broaden near the base, forming the pseudostem of the plant. The pseudostem is tall and robust, with oblong/elliptic leaves narrowed at the base (Parthasarathy & Chempakam, 2008).