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**EFFECT OF *Centella asiatica* (PEGAGA) FRESH EXTRACT ON LEARNING  
AND MEMORY ENHANCEMENT IN RATS**

**BY**

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## DECLARATION

I hereby declare that this thesis is my original work and has not been submitted previously or currently for any other degree at UiTM or any other institutions.

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## ABSTRACT

### EFFECT OF *Centella asiatica* (PEGAGA) FRESH EXTRACT ON LEARNING AND MEMORY ENHANCEMENT IN RATS

Memory disorders such as Alzheimer's disease and Parkinson's disease occurred mainly due to aging process. Aging will cause the degeneration of neurons and functional neuronal cells will decrease. The function of memory will decline by time thus will reduce the abilities of learning and memory processes. There are various synthetic drugs available for the treatment of these diseases. However, it will give bad side effects to the people who consumed it for the long-term period. Hence, the usage of natural product become a major choice among them. *Centella asiatica* has been used to treat ulcer, asthma, and inflammation. It has been reported to possess antitumor, antioxidant, and antibacterial properties. Unfortunately, there is lack of scientific report about its ability to improve learning and memory status. The present study was conducted to study the effect of *Centella asiatica* fresh extract on learning and memory enhancement in rats. Two different species of *Centella asiatica* have been used which are small type and big type. The rats were divided into four groups which are control, low dose, medium dose, and high dose that were supplemented with distilled water, 6 mg/kg, 12 mg/kg, and 24 mg/kg respectively for six weeks. The extracts were given orally by force-feeding except for control group. After six weeks, the behavioural study assessment (Novel Object Discrimination) was carried out. Performance of the rats were evaluated by the time of exploring familiar and novel object and also the discrimination index (D2). Based on the results, low dose group of rats supplemented with *Centella asiatica* small type showed a positive value of D2 which indicates that they spent more time in exploring novel object compared to familiar object but it is not significantly different compared to control. The medium and high dose groups showed a negative values of D2. Therefore, the effective dosage of this extract is 6 mg/kg. However, for rats that were supplemented with *Centella asiatica* big type extracts, all of them gave a positive value of D2 but only low dose group was significantly different to control group. This study suggested that both types of *Centella asiatica* enhanced the learning and memory in rats. This study also showed that the big type of *Centella asiatica* fresh extract is more effective compared to *Centella asiatica* small type fresh extract.

# CHAPTER 1

## INTRODUCTION

### 1.1 Research background

#### 1.1.1 General story about plant

Nowadays, various plants are being used in alternative and complementary medicine especially among Malaysians. It is point out that plants are known to have tremendous potential in order to prevent or cure various diseases. Herbaceous plants have become the eminent basis of traditional medicine that have been used widely in many countries such as Egypt, China, and India (Balandrin, Kinghorn, & Farnsworth, 1993). These plants also becoming the main choice for people nowadays because at this moment they noticed that synthetic drugs may have side effects. Therefore, they prefer to use the natural products as the remedies for various diseases.

The world market also turning towards plants as the source of ingredients in producing the health care products because they believed that the secondary metabolites obtained from the plants are important source of various phytochemicals that have many benefits in health care (Sahoo, Pattnaik, & Chand, 1997). The famous plants that are used among Malaysians are *Centella asiatica*, *Aloe vera*, garlic, ginger, and other. In addition, the herbaceous plants not only beneficial for health but they also can be an enhancement or supplement for beauty, memory, emotional, fertility or any other problems related with. World Health Organization (WHO) estimated that about 80% of the population in the world depend mainly on traditional medicines for their primary health care (Farnsworth, Akerele, Bingel, Soejarto, & Guo, 1985).