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THE EFFECTS OF MYRMECODIA PLATYTYREA EXTRACT ON BEHAVIORAL PARAMETERS IN LIPOPOLYSACCHARIDE-INDUCED NEUROINFLAMMATION BALB/C MICE

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ABSTRACT

Neuroinflammation plays detrimental role in neurodegenerative disease, particularly Alzheimer's disease. This research deals with *Myrmecodia platytyrea*, in which the main focus is to discover the neuroprotective effect of the extract on behavioral parameters, specifically, on cognitive function. Lipopolysaccharide was used to induce neuroinflammation in balb/c mice for the evaluation of neuroprotective effect of *M. platytyrea* tuber extract. 20 mg/kg, 50 mg/kg and 100 mg/kg of *M. platytyrea* extract were administered orally into mice for 21 days. Lipopolysaccharide with dose of 0.25 mg/kg was then injected intraperitoneally into mice along with oral administration of *M. platytyrea* for another 7 days. 0.9% normal saline were injected into 6 mice throughout 7 days as vehicle control group. Piracetam was administered orally into 6 mice along with intraperitonal injection of lipopolysaccharide throughout 7 days as standard or treatment control group. Locomotor activity test was used to evaluate general locomotor activity of mice. This study showed that there is decreased in locomotor activity in mice with non-significant decrease were observed in total distance travelled and average speed of mice. Meanwhile, *Morris* water maze task was performed to evaluate the capacity of animal to retrieve and retain learned information, thus reflecting cognitive performance related to spatial memory. Administration of lipopolysaccharide for one week period non-significantly impaired cognitive task. Four weeks *M. platytyrea* treatment non-significantly improved behavioral alterations, indicated by shortened latency to escape, decreased total distance travelled and increased average speed. This study highlights the potential of *M. platytyrea* to attenuate lipopolysaccharide-induced behavioral and cognitive deficits in balb/c mice.

CHAPTER 1

INTRODUCTION

1.1 Research background

Alzheimer's disease (AD) is an irreversible, progressive neurological disorder which results in the loss of cognitive function such as thinking and remembering (Mitran, Catalin, Sfredel, & Balseanu, 2013; Weiner *et al.*, 2012). AD is named after a German neurologist, Dr. Alois Alzheimer, who first discovered about the disease in 1906 (Graeber *et al.*, 1997). It is the most common form of dementia i.e memory loss among older people that interferes with person's functioning. Currently, more people are diagnosed with AD and the number is expected to increase rapidly in the near future (Brookmeyer, Johnson, Ziegler-Graham, & Arrighi, 2007; Mitran *et al.*, 2013; World Health Organization, 2012).

AD gradually worsens over time, becoming severe enough to affect not only intellectual abilities but also locomotor activity. Symptoms of AD include memory loss, behavioral changes and language problem. In the early stage, people with AD only show mild memory loss, but as the disease progress to the late-stage, the person will lose their ability in completing daily task. This is due to disorientation, severe confusion and difficulty moving (Alzheimer's Association, 2012; Hung, Chen, Hsieh, Chiou, & Kao, 2010). It is believed that before the first sign of AD becomes