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EFFECTS OF *Myrmecodia platytyrea* EXTRACT ON IMMUNOLOGY STATUS (*IN VITRO*)

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ABSTRACT

The *in vitro* study on immunology status is performed to determine the immunomodulatory effect of extracts on cell lines. The purpose of this study is to investigate the immunomodulatory response of *Myrmecodia platytyrea* hexane and methanol extracts toward Wistar rat's lymphocytes and to study the cytotoxic effect of both extracts on macrophage RAW 264.7. Both experiments were using MTS assay to get rate of proliferation and rate of cell death. In determining the lymphocyte proliferation activity, mitogen such as PHA was used as a positive control. The concentrations of *Myrmecodia platytyrea* of both extracts used in this experiment are 0.0001, 0.001, 0.01, 0.1, and 1 mg/mL. Both extracts induced the proliferation of lymphocytes. However, PHA significantly ($p< 0.05$) stimulated the proliferation of lymphocytes about 204 % compared with hexane extract and 194 % as compared with methanol extract. *Myrmecodia platytyrea* extracts also showed concentration – dependant cytotoxicity on macrophage RAW 264.7. For hexane extract, the IC_{50} value was 6.7 ± 5.7 µg/ml with the maximum inhibition at 102.75 %. While for methanol extract, the IC_{50} value was 220.3 ± 53.5 µg/ml with the maximum inhibition at 165.06 %. In conclusion, *Myrmecodia platytyrea* hexane extract is more cytotoxic than methanol extract. On the other hand, both hexane and methanol extracts stimulated the proliferation of lymphocytes. However, methanol extract showed higher proliferative activity towards lymphocytes than hexane extract. It is believed that the proliferation activity of the *Myrmecodia platytyrea* extracts was due to the flavonoid and terpenoid compounds that contained in both extracts.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Immune system is a defense system within vertebrates that protects the body from invasion by foreign elements including pollens and microorganisms. An antigen is any foreign invader that induces and reacts with immune cells and the molecules it induces (for example antibodies).

Lymphocytes and macrophages are the cells that are responsible for the immune activity. Lymphocytes play their role by reacting with antigens, thus initiating immune responses. Two types of immune responses are: cell mediated-response and the humoral response**.** Cell-mediated response is mediated by antigen-specific cells named thymus-derived or T lymphocytes (Elgert, 2009). Subpopulations of T cells are T helper (T_H) cells and T cytotoxic (T_C) cells. Macrophages, also known as phagocytic cells, involve in first line of defense system by ingesting and digesting whole bacteria and dead host cells. They will release cytokines (or monokines) during phagocytosis, such as tumor necrosis factor- α (TNF-α), interleukin-1 (IL-1), and IL-6 to activate many nonspecific protective effects through the inflammatory response (Elger, 2009).