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In vitro HAEMOSTATIC ACTIVITY OF *Rhodomyrtus tomentosa* (Aiton) Hassk. AQUEOUS LEAF EXTRACT

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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TABLE OF CONTENTS

ABSTRACT

In vitro HAEMOSTATIC ACTIVITY OF *Rhodomyrtus tomentosa* (Aiton) hassk. AQUEOUS LEAF EXTRACT

Thromboembolic is a disorder which rose up from the abnormal haemostasis process. Most of anticoagulant drug used in the treatment and prevention of thromboembolic disorder caused side effects such as bleeding. Potential of *Rhodomyrtus tomentosa* as a native anticoagulant been tested by evaluating the possible haemostatic effect of *Rhodomyrtus tomentosa* aqueous leaf extract *in vitro*. *In vitro* coagulation assays such as Thrombin time (TT), Prothrombin time (PT) and Activated partial thromboplastin time (APTT) tests were performed on normal coagulation control plasma spiked with different concentrations of the aqueous leaf extract (10 – 100%). Total tannin and flavonoid for all different concentrations of leaf extract were measured using spectrophotometer and correlate with clotting times (TT, PT and APTT). The results were analyzed using one way ANOVA followed by post-hoc Dunnet's and Pearson's correlation. The results showed that TT, PT and APTT of normal coagulation control plasma spiked with extract were markedly prolonged. A significant anticoagulant ($p < 0.05$) showed by PT was at lowest concentration (10%), TT was at concentration 50 – 100% and APTT was at concentration 80% - 100%. The aqueous extraction showed a better anticoagulant for PT. The clotting times for TT, PT and APTT were significantly correlated ($p < 0.05$) with total tannin and flavonoid. Besides, the total tannin and flavonoid was significantly decreased ($p < 0.05$) when exposed to the light for 5 days. In conclusion, the results highlights that *Rhodomyrtus tomentosa* contain anticoagulant properties reflected the bioactive compound of tannin and flavonoid.

Key words: *Rhodomyrtus tomentosa*, anticoagulant, haemostasis, intrinsic pathway, extrinsic pathway.

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Haemostasis is a normal process which stops the significant loss of blood following vascular injury (Sandhyarani, G., 2014). This process is depends on a balance of the processes of procoagulant and anticoagulant. At the site of tissue damage, there are four interrelated and interdependent systems which controlled the transformation of fluid state of blood into a localized thrombus. They are the vascular endothelium, platelets, the coagulation pathway and fibrinolysis (Austin, S. K., 2013). Primary haemostasis is rapidly occurs following vascular injury with platelet plug formation and vasoconstriction, while secondary haemostasis involved the exposure of tissue factor expressing cells and the formation of insoluble fibrin fibres (Batty, P. & Smith, J. G., 2010). The abnormalities of any processes may associate with haemostasis disorders.

The disorders of haemostasis involved two major categories which are platelets and coagulation factors. Where abnormal function of platelets can increase or prevent the activation, adhesion or aggregation. Besides, platelets abnormality can increase or decrease pro-clotting or anticlotting coagulation factors (Austin, K. S., 2013). The disorders of haemostasis respectively associated with primary and secondary haemostasis. Where von Willebrand's disease (vWD) or commonly associated with bleeding disorder was caused by the defect of von Willebrand's factor (vWF) which is the factor involved in the primary haemostasis (Batty, P. & Smith, J. G., 2010) same with the platelets disorders (McDonald, V. & Scully, M., 2008) which associated with primary haemostasis. While the disorder that associated with secondary haemostasis mostly the disorder that associated with coagulation factors such as Haemophilia A and B which caused by the defect of factors VIII or