UNIVERSITI TEKNOLOGI MARA

THE ACUTE TOXICITY OF *Averrhoa bilimbi* Linn LEAVES AND FRUITS ETHANOLIC EXTRACTS AND THEIR ANTIDIABETIC AND ANTICOAGULANT ACTIVITIES

NURAFIFAH BINTI DAUD

Thesis submitted in fulfilment
of the requirements for the degree of
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Faculty of Applied Sciences

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CONFIRMATION BY PANEL OF EXAMINERS

I certify that a Panel of Examiners has met on 29th September 2015 to conduct the final examination of Nurafifah Binti Daud on her Master of Science thesis entitled " The Acute Toxicity Of *Averrhoa bilimbi* Linn Leaves And Fruits Ethanolic Extracts And Their Antidiabetic And Anticoagulant Activities" in accordance with Universiti Teknologi MARA Act 1976 (Akta 173). The Panel of Examiners recommends that the student be awarded the relevant degree. The Panel of Examiners was as follows:

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledge as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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ABSTRACT

Diabetes mellitus is associated with hypercoagulation by altering the clotting factor levels. Hypercoagulation may increased thrombus formation, leading to thrombosis and other cardiovascular diseases. *A. bilimbi* has been reported to have hypoglycemic activity. Therefore this study is attempted to investigate whether *A. bilimbi* could also reduced hypercoagulation following a reduction in blood glucose level. The rats were made diabetic using intraperitonial injection with alloxan monohydrate at a dose of 160 mg/kg. Acute toxicity of an ethanolic *A. bilimbi* leaves and fruits extract were conducted on normal rats at doses of 2000 and 5000 mg/kg in a volume of 1 ml/100 g. Glucose tolerance were studied on alloxan-diabetic rats using doses of 75, 125 and 250 mg/kg. In anticoagulant study, ethanolic extract of leaves and fruits of *A. bilimbi* (250 mg/kg) respectively was orally administered to both normal and diabetic Sprague Dawley rats for 14 consecutive days. After 14 days, samples of blood were then drawn and centrifuged (5000 rpm,15 min, 4°C) to obtain the plasma. Anticoagulant activity of the samples was assessed using thrombin assay and clotting time assay. Data were compared using paired sample t-test by SPSS. The present study found that an ethanolic extract of *A. bilimbi* leaves and fruits extract having acute toxicity that lies in the range of 2000 mg/kg < LD_{50} < 5000 mg/kg, regulate glucose effectively at a dose of 250 mg/kg, and possess anticoagulant activity that acted through fibrinolysis and thrombin inhibition. The strength of anticoagulant activity in descending order is heparin > *A. bilimbi* leaves > metformin > *A. bilimbi* fruits. Hepatoprotective and nephroprotective effect was also observed in liver and kidney sections of alloxan-diabetic rats after treatments with *A. bilimbi* extract. It was a great choice to use *A. bilimbi* in the treatment of diabetes mellitus since it possess both antidiabetic and anticoagulant activity, as well as tissue protective effect.

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