UNIVERSITI TEKNOLOGI MARA

THE EFFECTS OF TRIGONELLA FOENUM GRAECUM AND ITS SAPONINS ON INFLAMMATION, OXIDATIVE STRESS, ENDOTHELIAL ACTIVATION AND MONOCYTE BINDING ON HUMAN CORONARY ARTERY ENDOTHELIAL CELLS

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MSc

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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, 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 other degree or qualification.

I hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

There has been a shift towards utilizing natural products as an adjunct therapy to the standard treatment in the prevention of coronary artery disease (CAD), and *Trigonella foenum graecum* (TFG) is one of the potential natural products of interest. TFG contains approximately 4-8% of saponins which may have beneficial effects on human health. However, to date, there have been few studies on the potential atheroprotective properties of TFG and its saponins. The objective of this study is to determine the anti-atherosclerotic effects of ethanolic TFG crude extract and its saponins *in-vitro*. Antioxidant properties of TFG and its saponins were measured using DPPH, FTC and DCFHDA assays. Protein expression of eNOS, inflammation, endothelial activation and NF-κB were measured by Procarta and ELISA assays, gene expression via qPCR, and effects on interaction between monocyte and HCAECs through monocyte binding assay after 16 hours of treatment with TFG and saponins. The results showed both TFG and saponins are not potent anti-oxidants, saponins shows increment on eNOS and reduction on IL-6 and IL-8. TFG reduced ICAM-1 and VCAM-1 better than saponins, while saponins reduced E-selectin better than its crude extract, saponins reduced NF-κB p50 and p65 better than TFG, and treatment with TFG gave high percentage inhibition on monocyte-endothelial cell interaction than saponins. In conclusion, TFG reduces endothelial activation better than its saponins suggesting that this could be due to synergism with other compounds present in the extract. However, saponins appear to exert better antioxidant properties and anti-inflammatory effects in its single form suggesting the possibility of other compounds in TFG that may attenuate the antioxidant and anti-inflammatory properties of saponins.

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