UNIVERSITI TEKNOLOGI MARA

DETERMINATION AND QUANTIFICATION OF SUCROSE IN DIFFERENT PARTS OF WATERMELON (*Citrullus lanatus*) BY USING REVERSE PHASE HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (RP-HPLC)

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DECLARATION BY STUDENT

Thesis entitled “Determination and Quantification of Sucrose in Different Parts of Watermelon (*Citrullus lanatus*) by Using Reverse phase High Performance Liquid Chromatography (RP-HPLC)” is the results of my own work. I also declare this thesis has not previously or currently submitted by any other degree student at UiTM or other institutions. This final year project was done under guidance of Supervisor, Dr Wan Mazlina Md Saad and Co Supervisor, Dr Fatimah Salim. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Medical Laboratory Technology (Hons).

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In the name of Allah, The Most Gracious, The most Merciful

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ABSTRACT

The main sugars that accumulate in watermelon consist of sucrose, glucose and fructose that determine sweetness of watermelon. The highest contribution of glucose and fructose in watermelon fruits is occurred during the early stages of fruit development, while sucrose proportion is detected when maturity is achieved. So far, there is uncertainty in determining the maturity of watermelon and insufficient information of sucrose content in watermelon. The present study aims to determine and quantify the presence of sucrose in different parts of watermelon consist of flesh, rind and peel in the fresh juice and freeze dried samples by isocratic mode using reverse phase high performance liquid chromatography (RP-HPLC). The analysis was carried out using a mixture of acetonitrile (ACN) and ultrapure water (75:25, v/v) as mobile phase at isocratic elution conditions of 0-20 min. The chromatography separation was performed using ZORBAX NH_2 column at flow rate of 1 ml/min and refractive index detection (RID). Sucrose standard was detected at 13.743 min of retention time. Linear standard curve at $R^2 = 0.9993$ with very low limit of detection and limit of quantification at 0.00002 and 0.00007 mg/mL, respectively. In fresh juice samples, sucrose was detected at retention time of 13.754 minutes and 13.960 minutes with concentration of 7.86mg/mL and 0.61mg/mL in flesh and rind fresh juice, respectively. Meanwhile, in freeze dried samples, sucrose was only detected at retention time of 13.644 minutes with concentration of 0.96mg/mL in flesh. The isocratic mode RP-HPLC proved to be efficient method for determination and quantification of sucrose in fresh juice and freeze dried watermelon samples.

Keywords: *Citrullus lanatus*, Watermelon, Sucrose, Reverse Phase HPLC, Refractive Index Detection (RID)