

UNIVERSITI TEKNOLOGI MARA

**QUANTITATIVE ANALYSIS OF CAPSAICIN IN
CHILLI PEPPERS USING HIGH-
PERFORMANCE LIQUID CHROMATOGRAPHY**

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APPROVAL SHEET

I hereby recommend that the thesis prepared under my supervision by Afzan Raihan Izzati Binti Hamzah entitled “Quantitative Analysis of Capsaicin in Chilli Peppers using High-Performance Liquid Chromatography” was accepted in partial fulfilment of the requirements for Degree of Pharmacy from Faculty of Pharmacy, UiTM.

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ABSTRACT

Capsaicin is the active component of chilli which is responsible for the hotness and pungency of the fruit. Regular intake of capsaicin is claimed to be beneficial for our health. As Malaysian consume high amount of spicy food, it is anticipated that they might obtain the health benefit from consuming capsaicin. Therefore, the purpose of this study is to quantify the amount of capsaicin in commonly used chilli in Malay cuisine and to identify whether the amount taken exceeds the safe limit. The effect of colour, sizes, species, grinding, drying and processing of chilli were studied. Chilli samples were analysed using High-Performance Liquid Chromatography (HPLC). The mobile phase was 45% acetonitrile to 55% acetic acid (0.5%). The temperature was maintained at 30 °C and the flow rate was set to 1mL/min. Quantification was based on retention times and UV response at 280nm. The method was successfully used to quantify the concentration of capsaicin in 11 samples. The highest concentration of capsaicin was detected in grounded dry chilli (1778.26 µg/g) because the sample has the lowest water content, thus more concentrated. The concentration of capsaicin in fresh *Capsicum annuum* was too low (<100 µg/g), thus undetectable. *Capsicum frutescens* is smaller as compared to *Capsicum annuum* but it has higher amount of capsaicin. This result suggests that the varying amount of capsaicin is related to the chilli species and not due to the size. The concentration of capsaicin in red chilli (957.74 µg/g) is higher than in green chilli (597.93 µg/g) due to the difference in ripeness of the fruit. As the concentration of capsaicin is always higher in the grounded samples, it can be said that grinding provides greater extraction of capsaicin from the fruit. The result also suggests that processing of chilli increases the concentration of capsaicin because the sample becomes more concentrated. It can be concluded that capsaicin concentration in commonly used chilli is relatively low (<2 mg/g). There is no scientific data on therapeutic level of capsaicin. However, according to the European Council, occasional and mild consumption of capsaicin (1.5 mg/day) is considered safe.