



## THE EFFECT OF THE DRYING AND EXTRACTION METHODS ON THE PECTIN YIELD AND THE OPTIMIZATION OF MICROWAVE-ASSISTED PECTIN EXTRACTION FROM KAFFIR LIME (*CITRUS HYSTRIX*) POMACE

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### ABSTRACT

This research aimed to determine the effect of the drying methods (hot air oven and microwave oven) and extraction methods (water bath and microwave oven) on the pectin yield from kaffir lime (*Citrus hystrix*) pomace. The optimal conditions for pectin extraction were studied, and the equation for predicting the pectin yield was determined. The drying method did not significantly affect the pectin yield, but the extraction method did significantly affect the yield. The pectin yield from kaffir lime pomace extracted with a microwave oven (34.07%) was 1.5 times higher than that extracted with a hot air oven (22.32%). For the determination of the optimal conditions for the microwave-assisted pectin extraction from kaffir lime pomace, a Box-Behnken design was used with 3 factors at 3 levels, including the solid to liquid ratio (1 to 12, 1 to 30, and 1 to 48 g/mL), the pH (1, 1.5, and 2), and the microwave irradiation time (10, 20, and 30 min). The optimal conditions were 1 to 23 solid to liquid ratio, pH 1.6, and an 18-min irradiation time with the microwave power at 450 W, which resulted in a yield of 29.21%. The equation for the prediction of the pectin yield was obtained from fitted experimental data ( $R^2 = 0.93$ ). The chemical properties of pectin extracted from the optimal conditions included the moisture content, ash content, equivalent weight, methoxyl content, anhydrouronic acid content and esterification level, which were 9.57%, 2.85%, 526.87 g, 10.46%, 92.79% and 64.00%, respectively.