

## ABSTRACT

Crops Cashew (*Anacardium occidentale* L.) have various properties empirically. Based on studies, the extracts of bark, leaves and fruits of cashew has a variety of activities such as anti-inflammatory, antihyperglycaemia, anticancer, anti-fungal, antibacterial, antilarvasida, and anti-*Helicobacter pylori*. This study aims to determine the extraction conditions that produce optimum total phenol content with variations in particle size of the powder, the polarity of the solvent and solid-solvent ratio.

Response Surface Methodology (RSM) consists of two design experiments, the 1<sup>st</sup> experimental design and the 2<sup>nd</sup> experimental design. The design of experiments I order a screening step factor (screening test) that follows the design of the One-Variable-At-A-Time. Meanwhile, a second order experimental design optimization phase that follows the Box-Behnken design (BBD). Extraction is done on the variation of powder size (30; 40; and 50 mesh), the polarity of the solvent (ethanol 57.6; 67.2; and 76.8%), and material-solvent ratio (1: 6; 1: 8; and 1:10).

The RSM model for optimization of total phenol content is  $Y = 37,23 - 2,12X_1 + 1,08X_2 - 14,57,6X_3 + 6,65 X_1 X_2 - 2,59 X_1 X_3 - 1,28 X_2 X_3 + 5,55 X_1^2 - 3,93X_2^2 + 1,89 X_3^2$ . The optimum conditions RSM models are mesh particle size powders 49.94, 73.13% ethanol solvent polarity and material-solvent ratio of 1 : 6.34.

**Keywords:** cashew nuts, condensed tannins, Response Surface Methodology (RSM), Box-Behnken design (BBD)

## INTISARI

Tanaman Jambu Mete (*Anacardium occidentale* L.) memiliki berbagai khasiat secara empiris. Berdasarkan penelitian-penelitian yang sudah ada ekstrak kulit batang, daun dan buah semu jambu mete memiliki berbagai aktivitas seperti antiinflamasi, antihiperglikemi, antikanker, anti-fungi, antibakteri, antilarvasida, dan anti-*Helicobacter pylori*. Penelitian ini bertujuan untuk mengetahui kondisi ekstraksi yang menghasilkan kadar fenol total optimum dengan variasi ukuran partikel serbuk, polaritas pelarut dan rasio bahan-pelarut.

*Response Surface Methodology* (RSM) terdiri atas dua rancangan eksperimen, yaitu rancangan eksperimen orde I dan rancangan eksperimen orde II. Rancangan eksperimen orde I merupakan tahap penyaringan faktor (*screening test*) yang mengikuti desain *One-Variable-At-A-Time*. Sementara itu, rancangan eksperimen orde II merupakan tahap optimasi yang mengikuti *Box-Behnken Design* (BBD). Ekstraksi dilakukan pada variasi ukuran serbuk (30; 40; dan 50 mesh), polaritas pelarut (etanol 57,6; 67,2; dan 76,8%), dan rasio bahan-pelarut (1:6; 1:8; dan 1:10).

Model yang dihasilkan melalui RSM untuk optimasi kadar fenol total adalah  $Y = 37,23 - 2,12X_1 + 1,08X_2 - 14,57,6X_3 + 6,65 X_1 X_2 - 2,59 X_1 X_3 - 1,28 X_2 X_3 + 5,55 X_1^2 - 3,93X_2^2 + 1,89 X_3^2$ . Adapun kondisi optimum model RSM adalah ukuran partikel serbuk 49,94 mesh, polaritas pelarut etanol 73,13% dan rasio bahan-pelarut 1:6,34.

**Kata kunci :** jambu mete, tanin terkondensasi, *Response Surface Methodology* (RSM), *Box-Behnken Design* (BBD)