

Optimization of protein yields in water extracts of *Jackiopsis ornata* roots by response surface methodology using microwave assisted extraction (MAE)

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ABSTRACT

Optimization of protein yields in water extracts that were obtained from *Jackiopsis ornata* roots by Microwave assisted extraction (MAE) was established by a Circumscribed Central Composite Design (CCCD). MAE proved to be an optimum choice for the protein extraction. The highest yield (20.425 ± 108) was obtained with the parameters liquid to solid ratio ($S= 30:1$), particle size ($P=0.022 \pm 0.002$ mm (radius), temperature ($T= 65^\circ\text{C}$); microwave power ($W= 300\text{W}$) and extraction time ($t= 20$ minutes). Statistical analysis illustrated the adequacy of the generated full quadratic equation with ad high values of the coefficient of determination (R^2), adjusted coefficient of determination R^2_{adj} and predicted coefficient p of determination R^2_{pred} . The p value of the Lack of Fit test illustrated the adequacy of the model. The optimization conditions of extracting the protein was predicted to be with the parameters $S: 26$, $P: 0.0284$; $T: 65^\circ\text{C}$; $P: 303\text{ W}$ and $t: 20$ min. The high efficiency of MAE to obtain *J. ornata* protein extract encouraged further application on pilot and industrial scale.

KEYWORDS

Protein yields; Water extracts; *Jackiopsis ornata* roots

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