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IOP Conference Series: Materials Science and Engineering
Volume 716, Issue 1, 11 February 2020, Article number 012019
3rd Bioprocessing and Biomanufacturing Symposium 2019, BBS 2019; Swiss Garden Resort and SpaLumut, Perak; Malaysia; 9 April 2019 through 10 April 2019; Code 157612

Response surface optimization of the forward extraction of jacalin from jackfruit seeds using AOT / isooctane reverse micellar system (Conference Paper) (Open Access)

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Abstract

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Jacalin is the major protein contained in the crude extract of jackfruit (Artocarpus heterophyllus) seed that specifically recognizes and binds reversibly to galactose. Conventionally, purification of jacalin is carried out using the tedious and costly chromatographic techniques. In this study, extraction of jacalin from jackfruit seed crude extract were done using the sodium bis(2-ethylhexyl) sulfosuccinate (AOT)-based reverse micellar system . Reverse micellar extraction is an attractive alternative for downstream processing of various proteins. A successful reverse micellar extraction consists of two basic steps: forward and backward extraction . Forward extraction transfers a target protein from an aqueous solution into the reverse micellar solution, while backward extraction releases the protein from the reverse micelles structure into a new aqueous solution. The effects of the aqueous phase pH, NaCl concentration and AOT concentration on the forward extraction efficiency (FEE) are investigated using the response surface methodology (Box-Behnken Design). The main effects and interactions of the parameters are analyzed through the 3D surface plots. The optimum conditions for forward extraction were determined as follows: aqueous phase pH 4.58, 125 mM NaCl and 40 mM AOT . Under the optimal conditions, the FEE reached 88.04±1.30%, closer to 87.99% predicted by the model. The results indicated that AOT / isooctane reverse micelle system is effective in extracting jacalin from the jackfruit seed crude extract and verified the practicability of the BBD model for optimizing the main parameters in the forward extraction of jacalin .

SciVal Topic Prominence

Topic: Docusate Sodium | Micelles | Chymotrypsin

Prominence percentile: 73.651

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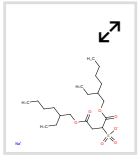
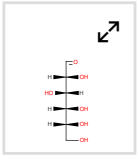

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Funding details

Funding sponsor	Funding number	Acronym
Universiti Malaysia Pahang	RDU170338,PGRS170346	

Funding text

The authors acknowledged the financial support provided by Universiti Malaysia Pahang (UMP) through a short-term internal research grant (RDU170338) and a postgraduate research grant (PGRS170346).

ISSN: 17578981
DOI: 10.1088/1757-899X/716/1/012019
Source Type: Conference Proceeding
Document Type: Conference Paper
Original language: English
Publisher: Institute of Physics Publishing

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