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Flash Communications

Abstracts



Extraction of aloeresin B from Aloe vera using alcohol-water mixtures: Process modelling and optimization

M. Añibarro-Ortega [a], J. Pinela [a], O. Ferreira [a], I.C.F.R. Ferreira [a], L. Barros [a]

[a] Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Sta Apolónia, 5300-253 Bragança, Portugal

mikel@ipb.pt

Aloeresin B is a C-glycosylated chromone found in Aloe species [1] with high potential to be used in cosmetic and health food industries due to its capacity to modulate the formation of melanin and beneficial effects on indices related to pre-diabetic states, including metabolic syndrome [2,3]. Therefore, given the high value of aloeresin B, this study was performed with the aim of optimizing its extraction from Aloe vera. For the optimization of the extraction process, time, temperature, and alcohol proportion were chosen as independent variables and combined in a 5-level central composite design of 20 runs coupled with response surface methodology. The solvent consisted of mixtures of water with ethanol, propane-1,2-diol, or propane-1,2,3-triol. The aloeresin B levels in the extracts were quantified by HPLC-DAD and used as response criterion. The theoretical models were successfully fitted to the experimental data, statistically validated with high coefficients of determination and F-values, and used to navigate the design space for obtaining the optimal extraction conditions. After that, a dose-response analysis of the solid/liquid ratio was performed under the optimal conditions previously determined for each alcohol-water binary mixture and demonstrated that an improvement in extraction efficiency can be achieved by increasing the ratio. This analysis also allowed to experimentally validate the predictive models. Considering the four variables involved in the extraction, it was concluded that the highest aloeresin B levels were originated by the propane-1,2-diol system. Overall, this study provides the optimal conditions for recovery of aloeresin B from Aloe vera through an eco-friendly extraction process.

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[1] M. Añibarro-Ortega, J. Pinela, L. Barros, et al., *Antioxidants* **2019**, 8, 444.

[2] H.M. Wahedi, M. Jeong, J.L. Chae, S.G. Do, H. Yoon, S.Y. Kim, *Phytomedicine* **2017**, 28, 19.

[3] B. Lynch, R. Simon, A. Roberts, *Regulatory Toxicology and Pharmacology* **2011**, 61, 161.