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Lista de Autores

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Sumário

Publicações relativas aos ingredientes com maior capacidade hipocolesterémica e que não apresentam toxicidade.

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1. Identificação

Deliverable	5.1.6
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2. Informação

A publicação relativa aos ingredientes com maior capacidade hipocolesterémica e sem toxicidade é:

Enhanced extraction of ergosterol from *Pleurotus ostreatus* using response surface methodology (RSM)
Taofiq O., Heleno S. A., Carocho M., Costa C., Prieto M. A., Barros J., Ferreira I., Nunes J., Barros L., Ferreira I. C. F. R.
XX EuroFoodChem Conference

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3. Anexos

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Enhanced extraction of ergosterol from *Pleurotus ostreatus* using response surface methodology (RSM)

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Pleurotus ostreatus (Jacq. ex Fr.) P. Kumm., is one of the most widely consumed mushrooms in the world with interesting health-promoting benefits, mainly due to its richness in several bioactive compounds [1]. Mushrooms produce ergosterol as one of their main sterols, which has been considered a contributor to their anti-inflammatory, antioxidant, and antitumor properties [2]. Obtaining an ergosterol enriched extract depends on different variables, such as the extraction method, solvent type, temperature, extraction time, and the solid-liquid ratio [2]. Therefore, it is essential to define the main variables and relevant response criteria to maximize the extraction yield and purity, combining the economic competitivity.
In the present work, response surface methodology (RSM) was applied to optimize a heat assisted extraction system (HAE), combining time (*t*) and temperature (*T*) effects, and using a circumscribed central composite design (*CCCD*) for the recovery of ergosterol from the fruiting bodies of *P. ostreatus produced with lignocellulose substract*. The obtained responses were the quantification of ergosterol by HPLC-UV (Y_1: mg of ergosterol per g of extract residue and Y_2: mg of ergosterol per 100 g of dry weight mushroom), and the extraction yield (Y_3: %). The *CCCD* consist of 16 response combinations and 4 centre points. Response surface models were fitted by using the following second order polynomial equation:

$$Y = b_0 + \sum_{i=1}^{n} b_i X_i + \sum_{\substack{i=1 \\ j>i}}^{n-1} \sum_{j=2}^{n} b_{ij} X_i X_j + \sum_{i=1}^{n} b_{ii} X_i^2$$

The results obtained showed a significant interaction between the variables. For all the three responses (Y_1, Y_2, and Y_3), the model successfully explained more than 80% variation in the experimental data (i.e. R^2>8). The individual optimum conditions and responses were as follows; Y_1 (10 min, 30°C, 57.6 mg/g), Y_2 (150 min, 61°C, 246.3 mg/100 g dw), and Y_3 (10 min, 80.9°C, 9.3%). The global optimum conditions predicted by the model were: 150 min and 54.3 °C, capable of yielding 7.3 %, 33.3 mg/g and 244.3 mg/100 g dw. The values predicted by the model are in close agreement with the experimental observations with very low residual distribution, proving the validity of the applied model. The results also showed the usefulness of the predictions for future scale up based on the desired responses. The obtained ergosterol enriched extract can be considered as a bioactive ingredient for pharmaceutical, cosmeceutical and nutraceutical purposes.

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References:

[1] A.A. Khan, A. Gani, A. Shah, F.A. Masoodi, U. Mushtaq, A. S Naik, Bioactive Carbohydrates and Dietary Fibre, 11 (2017) 67.
[2] S.A. Heleno, M.A. Prieto, L. Barros, A. Rodrigues, M.F. Barreiro, I.C.F.R. Ferreira, Food and Bioproducts Processing, 100 (2016) 25.