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20 anos CROMATOGRAFIA

11th NATIONAL MEETING ON CHROMATOGRAPHY

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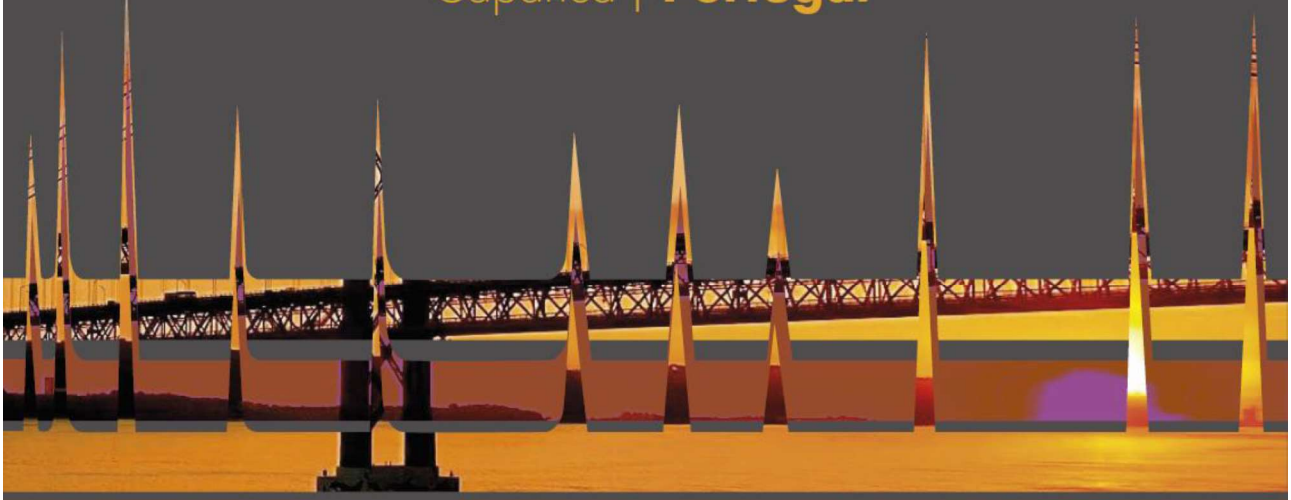

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P06 Ergosterol rich-extracts from *Pleurotus ostreatus* (Jacq. ex Fr.) P. Kumm: A comparative study between mushroom and its bio-residues

Taofiq Oludemi[1], Ana Rita Silva[1,3], Cristina Costa[2], Miguel A. Prieto[1,4], Joana Barros[2], Inês Ferreira[2], João Nunes[2], Lillian Barros[1], Isabel C.F.R. Ferreira[1,*]

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Edible, medicinal, and wild mushrooms are the three major components of the global mushroom industry, recently accounted for US$ 38.13 billion, and expanding at a compound annual growth rate (CAGR) of 7.9% from 2018 to 2026 [1]. Depending on the mushroom industry size, a large amount of bio-residues is generated and often discarded (20 to 35% in weight of fresh mushrooms), even though their content in biomolecules is not necessarily compromised [2].

Pleurotus ostreatus (Jacq. ex Fr.) P. Kumm is one of the most produced edible mushrooms worldwide due to its ability to colonize and degrade a large variety of lignocellulosic substrates [3]. In the present work, *P. ostreatus* bio-residues (POR) and intact mushrooms (POG) were compared for their ergosterol content. Response Surface Methodology (RSM) was applied using heat-assisted extraction methodology. The combined effect of time (10-150 min) and temperature (30-90°C) was performed using a circumscribed central composite design (CCCD), and the response criteria determined using the HPLC-UV were ergosterol content in mg/g (ergosterol purity) and mg/100g dw (ergosterol extraction yield). 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 global optimum conditions predicted by the model were 65.6 min, 30°C, and 10 min, 30°C for POR and POG, respectively. Under these conditions, 43.72 and 57.61 mg of ergosterol per 100 g of dry weight sample were recovered from POR and POG, correspondingly. Regarding the ergosterol content in dry weight basis (mg/100g dw), 290.90 and 246.31 were obtained for POG and POR, respectively. 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. Ergosterol and its well-known anti-inflammatory, anti-proliferative, and anti-tyrosinase activities, together with its use in new drug formulations associated with antibiotics, confirm the enormous potential of the under-exploited *P. ostreatus* bio-residues as a source of ergosterol-rich extracts.

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