LAQV requimte
Associated Laboratory for Green Chemistry

Webinars

March 11, 2026

An integrated approach for the valorization of polyphenol-rich extracts obtained from olive oil by-products.

Ricardo Hipólito

LAQV REQUIMTE, NOVA School of Science and Technology | NOVA FCT, Lisboa, Portugal
r.hipolito@campus.fct.unl.pt

Cardiovascular diseases (CVDs) continue to be one of the leading causes of death around the world, responsible for causing around 17.9 million deaths annually. Olives are a significant component of the Mediterranean diet and possess significant amounts of polyphenolic compounds such as hydroxytyrosol (HT) and tyrosol (TY), which have been subjected to various studies focusing on their cardioprotective effects and have been officially recognized by the European Food Safety Authority (EFSA) with the potential to protect blood lipids from oxidative stress. Oxidative damage to blood lipids plays a vital role in the development of atherosclerosis as well as other cardiovascular diseases. In this context, naturally occurring bioactive polyphenolic compounds present in the plant kingdom have garnered significant attention due to their health benefits.

This project is part of a collaboration between LAQV and the company Zeyton Nutraceuticals dedicated to the industrial scale recovery of bioactive polyphenols from olive pomace for application as ingredients in the food, cosmetics and nutraceutical industries. To enhance the quality and competitiveness of the extracts, and in addition to the membrane technology industrially implemented by Zeyton, an adsorption/desorption step is being optimized to maximize the concentration ratio

between polyphenols and hydrocarbons. Low molecular weight hydrocarbons are present in high concentrations and are responsible for the low stability of final powder formulations.

Within this framework, several commercial polymeric resins were evaluated for their ability to recover olive polyphenols from real complex matrices. These materials were evaluated in terms of adsorption capacity, recovery efficiency and performance in continuous operation mode. Furthermore, tailored adsorption materials were developed through Molecular Imprinting Technology using supercritical CO_2. Promising results were obtained towards the development of an integrated and sustainable strategy for the valorization of olive oil by-products.

Short Bio

Ricardo Hipólito is a PhD student whose work spans the entire valorization chain of olive-derived agro-industrial by-products, from extraction and purification to material development and final application. His research focuses on the recovery of high-value phenolic compounds, particularly hydroxytyrosol and tyrosol, using green and sustainable technologies such as supercritical CO_2 extraction and integrated adsorption-desorption processes. He is actively involved in the design, synthesis, and evaluation of selective adsorbent materials, including molecularly imprinted polymers, tailored for complex natural matrices. Beyond separation and purification, his work extends to application-driven studies, exploring the incorporation of olive phenolics into real systems such as food products, nutraceutical formulations, cosmetic creams, and functional formulations. By combining process engineering, materials science, and application-focused development, his research supports circular economy strategies and aims to bridge the gap between laboratory-scale innovation and industrially relevant solutions.

Acknowledgements

This work was funded by national funds from FCT - Fundação para a Ciência e a Tecnologia, I.P., under the scope of the projects UID/50006/2025 and LA/P/0008/2020 of the Associated Laboratory for Green Chemistry – LAQV RQUIMTE (https://doi.org/10.54499/UID/50006/2025 and https://doi.org/10.54499/LA/P/0008/2020). R.F. Hipólito acknowledges FCT/MCTES for his PhD Grant (UI/BD/154490/2022).

Webinar Host

Ana Rita Duarte, Bio(chemical) Process Engineering Group