



Towards automation for the green extraction of bioactive compounds

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Green extraction of bioactive compounds from natural sources and potential use as functional ingredients

Dr. Miguel Herrero Calleja

Tenured Researcher at CSIC-CIAL, Madrid (Spain)

Abstract

There is a rising trend in the pursuit of new natural ingredients that positively affect human health, driven by consumer demand. This increasing interest in natural bioactive compounds is encouraging the creation of innovative extraction methods to retrieve these compounds from a wide range of natural sources and biomasses. Products derived from plants, and both macro- and microalgae, serve as rich sources of these bioactive substances. Additionally, the enhancement of food by-products through eco-friendly methods is currently a significant area of research. In this regard, extraction techniques utilizing compressed fluids, including pressurized liquid extraction (PLE), supercritical fluid extraction (SFE), and gas-expanded liquids (GXL), have shown considerable promise for extracting natural bioactive compounds. Moreover, the stabilization of labile natural bioactive compounds is a need for further application in the food and nutraceutical sectors.

Linked to these developments, the close study of the bioactivity of the recovered compounds using diverse in vitro and in vivo models is also needed, not only to confirm their potential, but also to study their mechanisms of action. In this regard, the use of -omics approaches combined with bioactivity assays, in vitro simulated digestion approaches and green extraction methods is proposed as a comprehensive workflow to study the true potential of natural bioactive compounds.

 **November 17, 2026**

 **h. 15:00 – 16:00**

 **Polo Papardo, CHIBIOFARAM Department, Aula A.1.2
Viale F. Stagno d'Alcontres, 31 - 98166 Messina**

 **katia.buonasera@cnr.it**

